PROFINET

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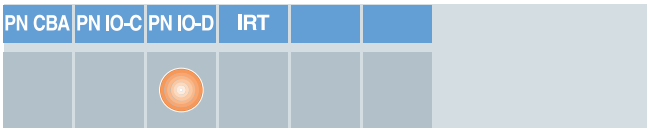
SCALANCE X-200 managed

Overview



- The unmanaged Industrial Ethernet switches of the SCALANCE X-200 product line are optimized for installing Industrial Ethernet networks with 10/100 Mbit/s in a line, star and ring topology
- Electrical or optical connection to stations or network in accordance with the port type of the devices
- Rugged metal housing in S7-300 format for mounting on standard rail, S7-300 standard mounting rail or for direct wall mounting in various positions
- Rugged, industry-standard station connections with PROFINET-compatible plug-in connectors that offer additional strain relief and bending strain relief thanks to latching on the housing
- Redundant power supply
- Diagnostics on the device by means of LEDs (power, link status, data communication)
- Error signaling contact with easy adjustment using the SET button
- The devices feature PROFINET diagnostics, SNMP access, integral Web server and automatic e-mail sending function for remote diagnosis and signaling over the network.

Benefits

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- Ideal solution for configuring Industrial Ethernet line, star and ring topologies
- Reliable data communication thanks to rugged device connection using PROFINET-compatible plug-in cables that offer additional strain relief and bending strain relief thanks to latching on the housing.
- High network availability through configuration of redundant ring topologies with SCALANCE X-400, SCALANCE X-200IRT or OSM/ESM as redundancy managers
- Fast and easy diagnosis with LEDs on the device, through the integral Web server and through signaling contacts
- Integration of the SCALANCE X-200 switches in the existing network management infrastructure through SNMP access point
- Easy integration in the process diagnosis and system diagnosis with PROFINET
- Configuration and diagnostics integrated into SIMATIC STEP 7 provide significant benefits during the engineering, start-up and operating phases of a plant
- Uncrossed connecting cables can be used due to the integrated Autocrossover function
- Module replacement without the need for a programming device, using the C-PLUG swap media for backing up the configuration data
- Arrangement possible without control cabinet since devices with high IP65 degree of protection

Application

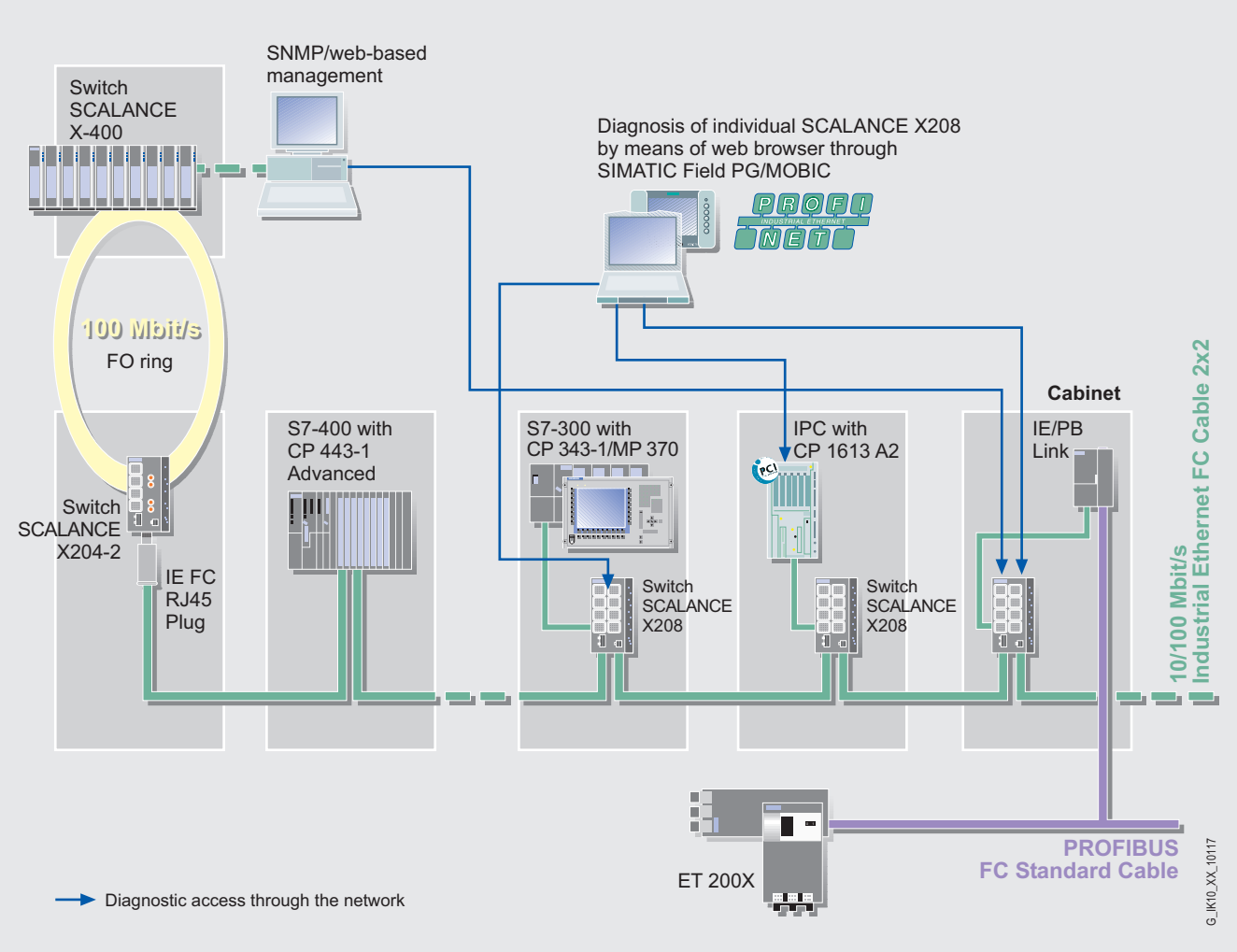
The SCALANCE X-200 Industrial Ethernet switches permit cost-effective configuration of Industrial Ethernet line, star or ring topologies with switching functionality where high network availability or remote diagnostics options are required. The devices with degree of protection IP30 have been designed for use in the control cabinet. The SCALANCE X208PRO, is designed to the degree of protection IP65 for installation outside the control cabinet.

Product versions

SCALANCE X204-2 / SCALANCE X206-1

- For configuring optical Industrial Ethernet line, ring or star topologies:
  - SCALANCE X204-2;
    optical line or ring topologies with 2 optical ports, 4 electrical ports
  - SCALANCE X206-1;
    Star topologies with 1 optical port, 6 electrical ports,
    line or ring topologies with electrical and optical transmission paths
- Device diagnostics with LEDs (power, link status, data communication)
- Remote diagnosis is possible through signaling contact (signal mask can be set locally using buttons), PROFINET, SNMP and Web browser
- The four (SCALANCE X204-2) or six (SCALANCE X206-1) RJ45 sockets are industry-compatible with additional retaining collars for connection to the new IE FC RJ45 Plug 180

Application (continued)



Line-shaped network topology with SCALANCE X204-2 and SCALANCE X208

SCALANCE X208 / SCALANCE X208PRO (degree of protection IP65)

- For configuring electrical Industrial Ethernet line, star or ring topologies (8 electrical ports):
  - SCALANCE X208 for installation in the switchgear cabinet
  - SCALANCE X208PRO, specially for use outside the switchgear cabinet
- Device diagnostics with LEDs (power, link status, data communication)
- Remote diagnosis with signaling contact (for SCALANCE X208: signal mask can be set locally using buttons), PROFINET, SNMP and Web browser
- The 8 RJ45 sockets of the SCALANCE X208 are designed for industry with additional retaining collars to connect the IE FC RJ45 Plug 180
- The 8 PROFINET conform M12 sockets of the SCALANCE X208PRO are in degree of protection IP65 to connect the IE M12 Plug PRO or the pre-assembled IE M12 connecting cable
- The SCALANCE X208PRO can be mounted on a DIN or S7-300 rail or in a space-saving, horizontal or vertical design directly on the equipment or machine;
  The status information can be read off regardless of the mounting position due to the angled LED strip.
- Power can also be supplied to the SCALANCE X208PRO from outside the control cabinet from the PS791-1PRO power supply module at 230 V AC.

SCALANCE X-200 managed

Design

The SCALANCE Industrial Ethernet switches with a rugged metal housing are optimized for mounting on a standard rail and an S7-300 rail. Direct wall mounting in various positions is also possible. With the S7-300 housing format, the devices are optimized for integration in an automation solution with S7-300 components.

The switches are equipped with

- a 4-pole terminal block,
- and SCALANCE X208PRO with 2 x M12 interfaces

for connecting the redundant supply voltage (2 x 24 V DC). The status information is indicated by means of a line of LEDs (power, link status, data communication, power supply, signaling contact).

The SCALANCE X-200 modules are available with the following port types:

- *10/100BaseTX, RJ45 or M12 connection*
  RJ45 socket or M12 socket, automatic detection of the data rate (10 or 100 Mbit/s), with Autosensing and Autocrossing function for connecting IE FC cables over IE FC RJ45 Plug or IP67 plug connectors over distances up to 100 m.
- *100BaseFX, BFOC connection technique*
  BFOC sockets for direct connection to Industrial Ethernet glass fiber-optic cables up to 3000 m for configuring line, ring and star topologies.

Function

- Configuring electrical and optical Industrial Ethernet line, star and ring topologies
- Use in rings (100 Mbit/s) together with SCALANCE X-400, SCALANCE X-200IRT or OSM/ESM as redundancy manager
- Uncrossed connecting cables can be used due to Autocrossover function integrated in the ports
- Load disconnection through integral switch functionality
- Easy diagnostics using signaling contact, SNMP and Web browser
- Simple copper cable diagnostics with Web browser for localizing cable breaks
- Integration into the diagnostics of a PROFINET IO-Controllers for a consistent diagnostics concept, including network infrastructure
- Diagnosis of data traffic by means of a parameterizable mirror port with a standard commercial network analyzer
- Optimized support of PROFINET realtime communication (RT) through prioritizing.
- Fast device replacement in the event of a fault by using the optional C-PLUG swap medium (not included in scope of supply)

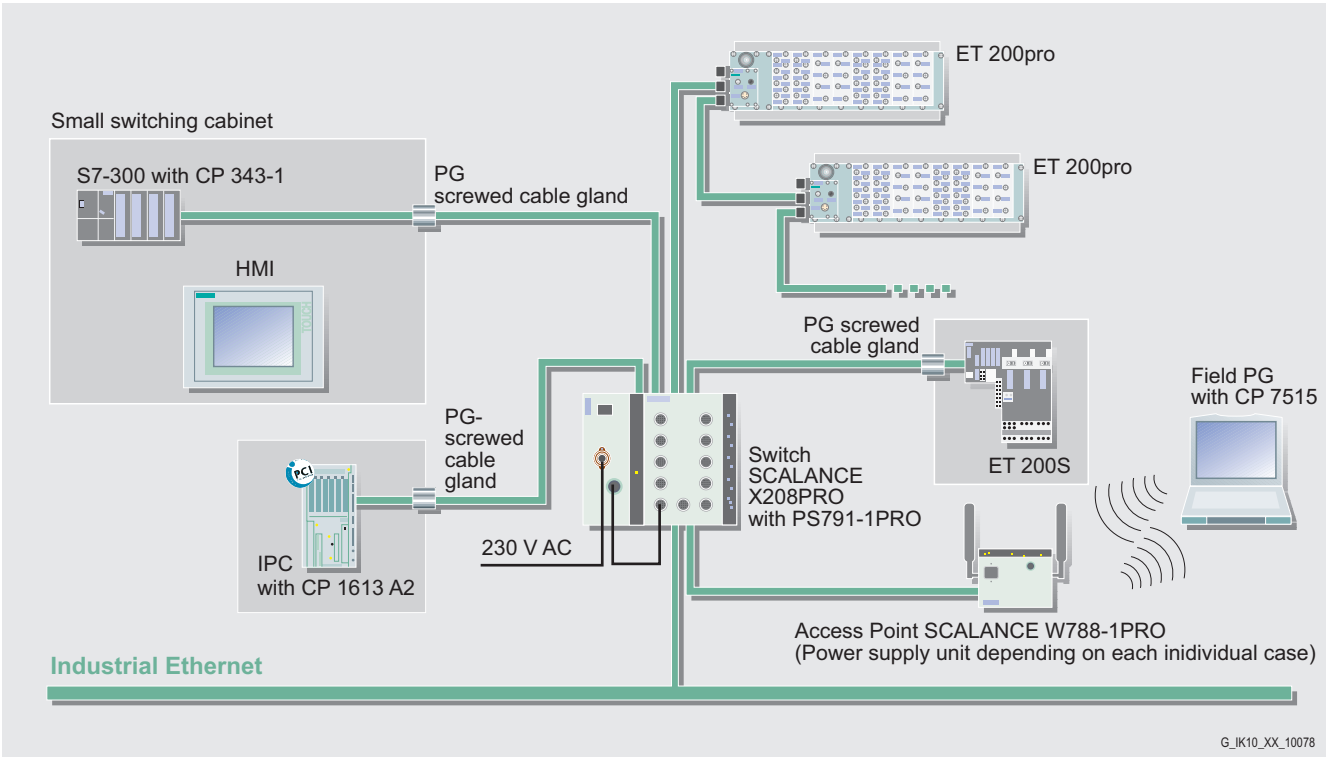
Network topology and network configuration

The Industrial Ethernet SCALANCE X-200 switches with degree of protection IP30 are usually installed in a control cabinet together with the stations to be connected. Electrical and optical versions can be installed together in star, line and ring topologies. The SCALANCE X208PRO is designed for installation outside the control cabinet.

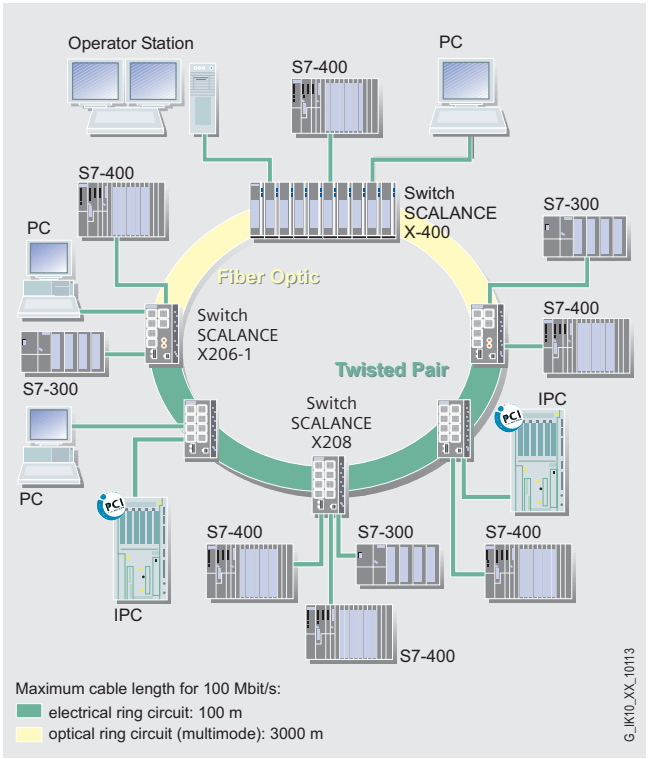
When configuring the network, it is necessary to observe the following boundary conditions:

- Length of the TP cable between two SCALANCE X switches:
  - max. 100 m with IE FC cable and IE FC RJ45 Plug 180 or IE M12 Plug PRO
  - max. 10 m with patches with TP Cord
- Length of the optical cables
  - max. 3000 m with Industrial Ethernet glass fiber-optic cables.
- IP Address:
  With the Industrial Ethernet switches of the SCALANCE X-200 family, the IP address is specified using DHCP (Dynamic Host Configuration Protocol). If an appropriate server is not available in the network, the IP address can be assigned using the supplied software tool or STEP 7.

Function (continued)



Star network topology with SCALANCE X208PRO outside the control cabinet and 230 V AC power supply



High speed redundancy in the ring with electrical and optical paths

Commissioning and diagnosis

PROFINET diagnostic alarms from SCALANCE X can be displayed with the appropriate SIMATIC Engineering Tools and processed in the control. The engineering outlay for the PLC and HMI have been drastically reduced through complete integration in the SIMATIC concept for system error messages.

The SCALANCE X-200 Industrial Ethernet switches can also be integrated into a network management system through the standardized protocol SNMP (Simple Network Management Protocol). In the event of a fault in the device, error messages (SNMP traps) can be sent to a network system or as e-mail to a specified network manager.

The integral Web server enables configuration and diagnosis settings to be made using a standard browser. Statistical information can also be read out over the Web server.

The following information is displayed by LEDs on the equipment:

- Power
- Port status
- Data communication
- Signaling contact

The Industrial Ethernet switches of the SCALANCE X-200 line can also be monitored using the floating signaling contact.

SCALANCE X-200 managed

Technical specifications

Type	SCALANCE X204-2	SCALANCE X206-1	SCALANCE X208	SCALANCE X208PRO
Transmission rate	10/100 Mbit/s	10/100 Mbit/s	10/100 Mbit/s	10/100 Mbit/s
Interfaces				
• Electrical	4 x RJ45 sockets (10/100 Mbit/s; TP)	6 x RJ45 sockets (10/100 Mbit/s; TP)	8 x RJ45 sockets (10/100 Mbit/s; TP)	8 x 4-pole M12 sockets (10/100 Mbit/s)
• Optical	2 x BFOC sockets (100 Mbit/s)	1 x BFOC sockets (100 Mbit/s)	–	–
• Connection for supply voltage	1 x 4-pole terminal block	1 x 4-pole terminal block	1 x 4-pole terminal block	2 x 4-pole M12 interface
• Connection for signaling contact	1 x 2-pole terminal block	1 x 2-pole terminal block	1 x 2-pole terminal block	1 x 5-pole M12 interface
Power supply	2 x 24 V DC (18 V to 32 V)	2 x 24 V DC (18 V to 32 V)	2 x 24 V DC (18 V to 32 V)	2 x 24 V DC (18 V to 32 V)
Current consumption	215 mA	200 mA	185 mA	185 mA
Power loss at 24 V DC	5.16 W	4.8 W	4.4 W	4.4 W
Network extension parameter / TP cable length				
• 0 - 100 m	IE FC Standard Cable with IE FC RJ45 Plug 180 IE FC Outlet RJ45 with IE FC Standard Cable (0 - 90 m) + 10 m TP Cord	IE FC Standard Cable with IE FC RJ45 Plug 180 IE FC Outlet RJ45 with IE FC Standard Cable (0 - 90 m) + 10 m TP Cord	IE FC Standard Cable with IE FC RJ45 Plug 180 IE FC Outlet RJ45 with IE FC Standard Cable (0 - 90 m) + 10 m TP Cord	IE FC Standard Cable with IE M12 Plug PRO –
• 0 - 85 m	IE FC marine/trailing/ flexible cable with IE FC RJ45 plug 180 IE FC marine/trailing/ flexible cable (0 - 75 m) + 10 m TP cord	IE FC marine/trailing/ flexible cable with IE FC RJ45 plug 180 IE FC marine/trailing/ flexible cable (0 - 75 m) + 10 m TP cord	IE FC marine/trailing/ flexible cable with IE FC RJ45 plug 180 IE FC marine/trailing/ flexible cable (0 - 75 m) + 10 m TP cord	IE FC marine/trailing/ flexible cable with IE M12 Plug PRO –
• 0 - 3000 m	Glass fiber-optic cable 62.5/125 µm or 50/125 µm; ≤ 1.0 dB/km at 1300 nm; ≥ 600 MHz x km	Glass fiber-optic cable 62.5/125 µm or 50/125 µm; ≤ 1.0 dB/km at 1300 nm; ≥ 600 MHz x km	–	–
Perm. ambient conditions				
• Operating temperature	0 °C to +60 °C	0 °C to +60 °C	-20 °C to +70 °C	-20 °C to +70 °C
• Transport/storage temperature	-40 °C to +80°C	-40 °C to +80°C	-40 °C to +80°C	-40 °C to +80°C
• Relative humidity during operation	< 95%, non-condensing	< 95%, non-condensing	< 95%, non-condensing	< 100%, non-condensing
Construction				
• Dimensions (W x H x D) in mm	60 x 125 x 124	60 x 125 x 124	60 x 125 x 124	90 x 125 x 124
• Weight	780 g	780 g	780 g	1000 g
• Mounting	Standard rail, S7-300 rail, wall mounting	Standard rail, S7-300 rail, wall mounting	Standard rail, S7-300 rail, wall mounting	Standard rail, S7-300 rail, wall mounting
Degree of protection	IP30	IP30	IP30	IP65
Approvals				
• Radio interference level	EN 50081-2 Class A	EN 50081-2 Class A	EN 50081-2 Class A	EN 50081-2 Class A
• Interference Immunity	EN 50082-2	EN 50082-2	EN 50082-2	EN 50082-2
• CuL listing	UL 60950, CSA C22.2 Nr. 60950	UL 60950, CSA C22.2 Nr. 60950	UL 60950, CSA C22.2 Nr. 60950	UL 60950, CSA C22.2 Nr. 60950
• FM	FM 3611	FM 3611	FM 3611	FM 3611
• ATEX Zone 2	EN 50021	EN 50021	EN 50021	EN 50021
• C-Tick	AS/NZS 2064 (Class A)	AS/NZS 2064 (Class A)	AS/NZS 2064 (Class A)	AS/NZS 2064 (Class A)
• CE	EN 50081-2, EN 50082-2	EN 50081-2, EN 50082-2	EN 50081-2, EN 50082-2	EN 50081-2, EN 50082-2

Ordering data		Order No.
Industrial Ethernet Switches SCALANCE X-200	H	
Industrial Ethernet switches with integral SNMP access, Web diagnostics, copper cable diagnosis and PROFINET diagnosis for configuring line, star and ring topologies		
• **SCALANCE X204-2;** with four 10/100 Mbit/s RJ45 ports and two fiber-optic ports		**6GK5 204-2BB00-2AA3**
• **SCALANCE X206-1**; with six 10/100 Mbit/s RJ45 ports and one fiber-optic port		**6GK5 206-1BB00-2AA3**
• **SCALANCE X208;** with eight 10/100 Mbit/s RJ45 ports		**6GK5 208-0BA00-2AA3**
• **SCALANCE X208PRO;** with degree of protection IP65, with eight 10/100 Mbit/s RJ45 ports, incl. eight RJ45 and three M12 dust protection caps		**6GK5 208-0HA00-2AA6** NEW
Accessories		
IE FC RJ45 Plug 180		
RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface		
• 1 pack = 1 items		**6GK1 901-1BB10-2AA0**
• 1 pack = 10 items		**6GK1 901-1BB10-2AB0**
• 1 pack = 50 items		**6GK1 901-1BB10-2AE0**
IE Connecting Cable M12-180/M12-180		NEW
Pre-assembled IE FC TP Trailing Cable GP 2 x 2 (PROFINET type C) with two 4-pole M12 plugs (4-pole, D-coded), degree of protection IP65		
Length:		
• 0.3 m		**6XV1 870-8AE30**
• 0.5 m		**6XV1 870-8AE50**
• 1.0 m		**6XV1 870-8AH10**
• 1.5 m		**6XV1 870-8AH15**
• 2.0 m		**6XV1 870-8AH20**
• 3.0 m		**6XV1 870-8AH30**
• 5.0 m		**6XV1 870-8AH50**
• 10 m		**6XV1 870-8AN10**
• 15 m		**6XV1 870-8AN15**

		Order No.
Accessories (continued)		
IE Power M12 Cable Connector PRO		**6GK1 907-0DC10-6AA3** NEW
Socket for connecting SCALANCE W-700/SCALANCE X208PRO for 24 V DC supply; 4-pole, a-coded with installation instructions		
Signalling Contact M12 Cable Connector PRO		**6GK1 908-0DC10-6AA3** NEW
Socket for connecting SCALANCE X208PRO for signaling contact; 5-pole, b-coded, with installation instructions		
Power supply PS791-1PRO	A	**6GK5 791-1PS00-0AA6**
AC/DC power pack, 10 W, IP65 (-20 to +60°C), Input: 85 V – 265 V AC, Output: 24 V DC, metal housing, Scope of supply: AC power 3+PE cable connector, DC power cord M12, installation materials, manuals German/English		
C-PLUG	A	**6GK1 900-0AB00**
Swap medium for simple replacement of devices in the event of a fault; for storing configuration or engineering and application data; can be used for SIMATIC NET products with C-PLUG slot		
Manual for TP and fiber-optic networks		
Paper version; network architecture, components, configurations, installation guidelines		
• German		**6GK1 970-1BA10-0AA0**
• English		**6GK1 970-1BA10-0AA1**

A) Subject to export regulations: AL: N and ECCN: EAR99H
H) Subject to export regulations: AL: N and ECCN: 5A991

SCALANCE X-200IRT managed

Overview

PN CBA	PN IO-C	PN IO-D	IRT		
			avail. soon		

- Especially designed for constructing real-time (RT) and isochronous real-time (IRT (available soon)) Industrial Ethernet segments in line, star and ring topologies with 10/100 Mbit/s (RM integrated); construction of redundant ring connections possible
- Combination of the switching mechanisms "Cut Through“ and "Store and Forward“; for optimized performance
- Electrical or optical connection to stations or network in accordance with the port type of the devices
- Rugged metal housing for space-saving cabinet mounting on standard rails, S7-300 DIN rail or for wall mounting
- Industry-standard compatible station connections with PROFINET-compatible plug-in connectors that offer additional strain relief and bending strain relief thanks to latching on the housing
- Redundant power supply
- Can be used for fault-tolerant applications and can be replaced during normal operation thanks to redundant transmission characteristics
- Diagnostics on the device by means of LEDs (power, link status, data communication)
- Error signaling contact with easy adjustment using the SET button
- The devices feature PROFINET diagnostics, SNMP access, integral Web server and automatic e-mail sending function for remote diagnosis and signaling over the network

Benefits

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- The ideal solution for constructing real-time (RT) and isochronous real-time (IRT (available soon)) Industrial Ethernet segments especially in line, star and ring topologies
- Reliable data communication thanks to industry-standard device connection using PROFINET-compatible plug-in connectors (IE FC RJ45 Plug) that offer additional strain relief and bending strain relief due to latching on the housing
- High network availability through design of redundant ring structures (RM integrated)
- Fast and easy diagnosis with LEDs on the device, through the integral Web server and through signaling contacts
- Integration of the SCALANCE X-200IRT switches in the existing network management infrastructure through SNMP access point
- Easy integration in the process diagnosis and system diagnosis with PROFINET
- Configuration and diagnostics integrated into SIMATIC STEP 7 provide significant benefits during the engineering, start-up and operating phases of a plant
- Uncrossed connecting cables can be used due to the integrated Autocrossover function
- Module replacement without the need for a programming device, using the C-PLUG swap media for backing up the configuration data

Application

The SCALANCE X-200IRT Industrial Ethernet switches permits the construction of real-time (RT) and isochronous real-time (IRT (available soon)) Industrial Ethernet segments in line and star topologies. Ring structures can also be designed using the integral redundancy manager. Redundant ring connections are also possible. Thanks to innovative switching technology, the special requirements of automation with regard to line topology, hard real time and unlimited IT openness have been satisfied within a single technology for the first time based on the PROFINET standard.

The switches with degree of protection IP30 have been designed for use in the control cabinet.

Product versions

SCALANCE X204IRT

- For configuring Industrial Ethernet line, star or ring topologies with 4 electrical ports

SCALANCE X202-2IRT

- For configuring optical Industrial Ethernet line, star or ring topologies with 2 optical ports and 2 electrical ports

For both versions:

- Device diagnostics with LEDs (power, link status, data communication)
- Remote diagnosis is possible through signaling contact (signal mask can be set locally using buttons), PROFINET, SNMP and Web browser
- Automatic e-mail send function
- The four (SCALANCE X204IRT) or two (SCALANCE X202-2IRT) RJ45 sockets are of industry-compatible design with additional holding collars for connection of the IE FC RJ45 Plug 180

Application (continued)

The SCALANCE X-200IRT switches, based on PROFINET, satisfy the real-time requirements of the field level up to high-performance motion control applications.

Real-time Ethernet

- Interfacing of the PROFINET IO-Devices to the PROFINET IO-Controller through high-performance, optimized data transmission
- Hard real-time and IT openness coexist:
  Reaction-free transmission of real-time and non-real-time communication on the same line
- Increased availability thanks to redundant transmission with bumpless changeover for real-time data

Additionally through isochronous real-time (IRT) Ethernet (available soon)

- Isochronous real-time communication based on the transmission procedure of the IEEE 802 by combining the switching mechanisms "Cut Through" and "Store and Forward".
- For drive controls, PROFINET with isochronous real-time is the best performing system worldwide with regard to its isochrone and deterministic response.
  With a cycle time of 1 ms, for example, 150 axes can be controlled in isochronous mode whereby 50% of the bandwidth is available solely for IT communication.
- The high-performance isochronous real-time (IRT) Ethernet will be available soon, and provided in a future version of the following products:
  - SCALANCE X204IRT
  - SCALANCE X202-2IRT
  - CP 1616 (V 2.0 and higher)
  - SIMOTION (available soon)
  - SINAMICS (available soon)

Design

- The SCALANCE X-200IRT switches with a rugged metal housing to degree of protection IP30 are optimized for mounting on a standard rail and an S7-300 rail. Direct wall mounting in various positions is also possible. With the S7-300 housing format, the devices are optimized for integration in an automation solution with S7-300 components.
  The switches have a 4-pin terminal block for connecting the redundant supply voltage (2 x 24 V DC).
  The status information is indicated by means of a line of LEDs (power, link status, data communication, power supply, signaling contact).

The SCALANCE X-200IRT modules are available with the following port types:

- *10/100BaseTX, RJ45 connection*
  RJ45 socket, automatic detection of the data rate (10 or 100 Mbit/s), with Autosensing and Autocrossover function for connecting IE FC cables over IE FC RJ45 Plug 180 over distances up to 100 m.
- *100BaseFX, BFOC connection technique*
  BFOC sockets for direct connection to Industrial Ethernet glass fiber-optic cables up to 3000 m for configuring line and star topologies.

Function

- 4-port switch for configuring electrical and optical Industrial Ethernet line, star and ring topologies
- Integral redundancy manager for design of ring topologies
- Integral standby function for redundant coupling of two rings
- Extremely short cycle times with highly accurate clock-pulse rates thanks to integrated real-time functions
- Redundant data transmission with bumpless changeover
- System-wide clock accuracy (less than 1 ms)
- Uncrossed connecting cables can be used due to Autocrossover function integrated in the ports
- Load disconnection through integral switch functionality
- Easy diagnostics using signaling contact, SNMP and Web browser
- Automatic e-mail function
- Integration into the diagnostics of a PROFINET IO-Controllers for a consistent diagnostics concept, including network infrastructure
- Fast device replacement in the event of a fault by using the optional C-PLUG swap medium (not included in scope of supply)

Network topology and network configuration

The Industrial Ethernet Switches SCALANCE X-200IRT are usually installed in the control cabinet together with the stations to be connected (e.g. ET 200S). When configuring the network, it is necessary to observe the following boundary conditions:

- Length of the TP cable between two SCALANCE X switches:
  - max. 100 m with IE FC cable and IE FC RJ45 Plug 180
  - max. 10 m with TP Cord
- Length of the optical cables
  - max. 3000 m with Industrial Ethernet glass fiber-optic cables.
- IP Address:
  The IP address is assigned using the BOOTP (Boot Protocol) and DHCP (Dynamic Host Configuration Protocol) mechanisms. If an appropriate server is not available in the network, the IP address can be assigned using the supplied software tool. The SCALANCE X-200IRT switches and their real-time functions are configured with STEP 7.

Commissioning and diagnosis

PROFINET diagnostic alarms from SCALANCE X can be displayed with the appropriate SIMATIC Engineering Tools and processed in the control. The engineering outlay for the PLC and HMI have been drastically reduced through complete integration in the SIMATIC concept for system error messages.

The SCALANCE X-200IRT Industrial Ethernet switches can also be integrated into a network management system through the standardized protocol SNMP (Simple Network Management Protocol). In the event of a device fault, error messages (SNMP traps) can be sent to a network system or as e-mail to a specified network manager.

The integral Web server enables configuration and diagnosis settings to be made using a standard browser. Statistical information can also be read out over the Web server.

The following information is displayed by LEDs on the equipment:

- Power
- Port status
- Data communication

The Industrial Ethernet switches of the SCALANCE X-200IRT line can also be monitored using the floating signaling contact.

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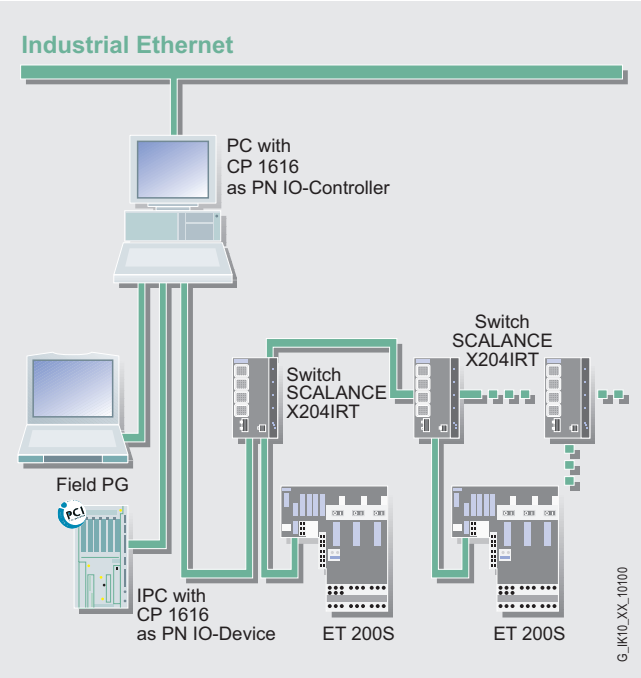
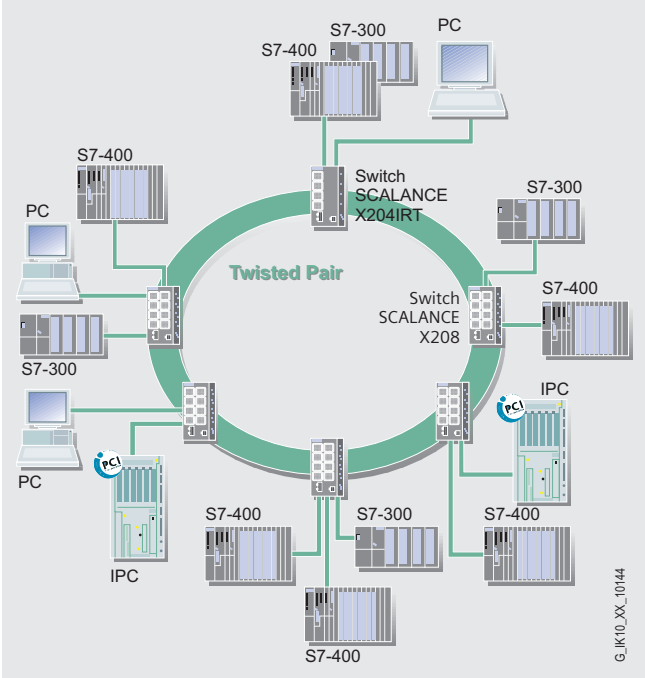
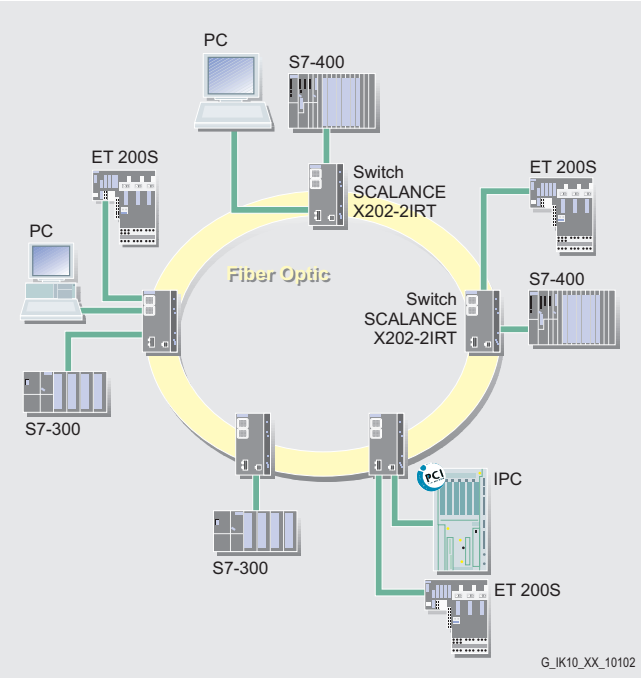
Function (continued)



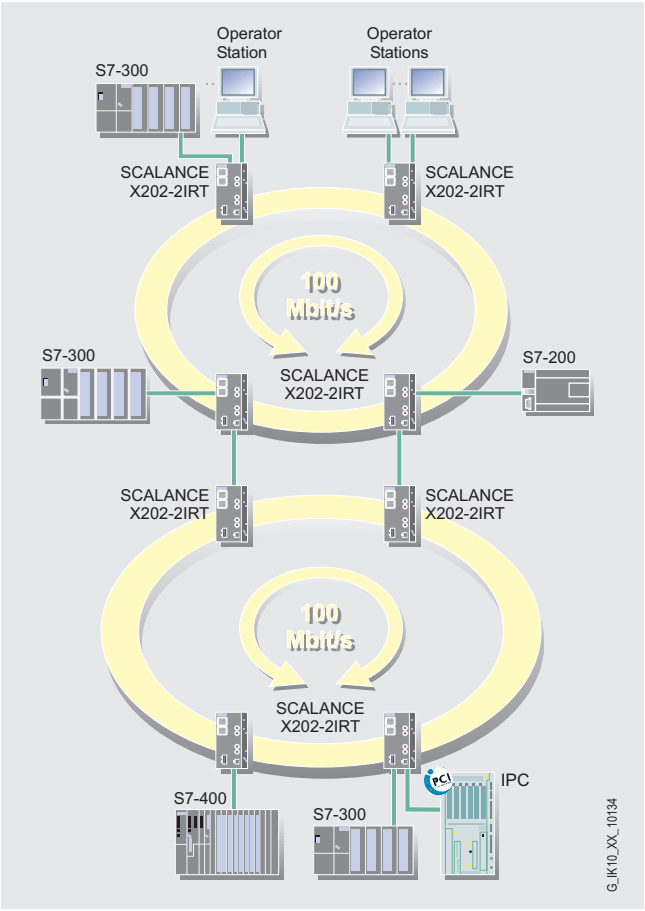
Configuration example for SCALANCE X204IRT



Configuration with high-speed redundancy in the electrical ring



Configuration with high-speed redundancy in the optical ring



Redundant coupling of two subnetworks with SCALANCE X-200IRT

Technical specifications

Type	SCALANCE X204IRT	SCALANCE X202-2IRT
Transmission rate	10/100 Mbit/s	10/100 Mbit/s
Interfaces		
• Electrical	4 x RJ45 sockets (10/100 Mbit/s; TP)	2 x RJ45 sockets (10/100 Mbit/s; TP)
• Optical	–	2 x BFOC sockets (100 Mbit/s)
• Connection for supply voltage	1 x 4-pole terminal block	1 x 4-pole terminal block
• Connection for signaling contact	1 x 2-pole terminal block	1 x 2-pole terminal block
Power supply	2 x DC 24 V (18 V to 32 V)	2 x DC 24 V (18 V to 32 V)
Current consumption	200 mA	300 mA
Power loss at 24 V DC	4 W	6 W
Network extension parameter / TP cable length		
• 0 - 100 m	IE FC Standard Cable with IE FC RJ45 Plug 180 IE FC Outlet RJ45 with IE FC TP Standard Cable + 10 m TP Cord	IE FC Standard Cable with IE FC RJ45 Plug 180 IE FC Outlet RJ45 with IE FC Standard Cable (0–90 m) + 10 m TP Cord
• 0 - 85 m	IE FC Marine/Trailing Cable with IE FC RJ45 Plug 180 IE FC Marine/Trailing Cable (0 - 75 m) + 10 m TP Cord	IE FC Marine/Trailing Cable with IE FC RJ45 Plug 180 IE FC Marine/Trailing Cable (0 - 75 m) + 10 m TP Cord
• 0 - 3000 m	–	Glass fiber-optic cable 62.5/125 µm or 50/125 µm; ≤ 1.0 dB/km at 1300 nm; ≥ 600 MHz x km
Perm. ambient conditions		
• Operating temperature	-20 °C to +70 °C	0 °C to +60 °C
• Transport/storage temperature	-40 °C to +80°C	-40 °C to +80°C
• Relative humidity during operation; non-condensing	< 95%, non-condensing	< 95%, non-condensing
Construction		
• Dimensions (W x H x D) in mm	60 x 125 x 124	60 x 125 x 124
• Weight	780 g	780 g
• Mounting	Standard rail, S7-300 rail, wall mounting	Standard rail, S7-300 rail, wall mounting
Degree of protection	IP30	IP30
Approvals		
• Radio interference level	EN 50081-2 Class A	EN 50081-2 Class A
• Interference Immunity	EN 50082-2	EN 50082-2
• CuL listing	UL 60950, CSA C22.2 Nr. 60950	UL 60950, CSA C22.2 Nr. 60950
• FM	FM 3611	FM 3611
• ATEX Zone 2	EN 50021	EN 50021
• C-Tick	AS/NZS 2064 (Class A)	AS/NZS 2064 (Class A)
• CE	EN 50081-2, EN 50082-2	EN 50081-2, EN 50082-2

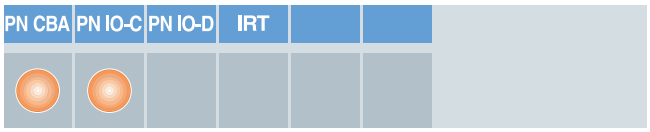
Ordering data

	Order No.
Industrial Ethernet Switches SCALANCE X-200IRT E Managed Industrial Ethernet Switches; isochrone real time, LED diagnostics, error signaling contact with SET button, redundant power supply	
• **SCALANCE X204IRT;** 4 x 10/100 Mbit/s RJ45 ports	**6GK5 204-0BA00-2BA3**
• **SCALANCE X202-2IRT;** 2 x 10/100 Mbit/s RJ45 ports, 2 x 100 Mbit/s Multimode BFOC	**6GK5 202-2BB00-2BA3**
IE FC RJ45 Plug 180 RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1 901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1 901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1 901-1BB10-2AE0**
C-PLUG A Swap medium for simple replacement of devices in the event of a fault; for storing configuration or engineering and application data; can be used for SIMATIC NET products with C-PLUG slot	**6GK1 900-0AB00**
Manual for TP and fiber-optic networks Paper version; network architecture, components, configurations, installation guidelines	
• German	**6GK1 970-1BA10-0AA0**
• English	**6GK1 970-1BA10-0AA1**

A) Subject to export regulations: AL: N and ECCN: EAR99H
E) Subject to export regulations: AL: N and ECCN: 5D002ENC3
H) Subject to export regulations: AL: N and ECCN: 5A991

CPU 315-2 PN/DP

Overview



- The CPU with a medium program memory and quantity framework
- High processing performance in binary and floating-point arithmetic
- Used as a central controller on production lines with central and distributed I/O
- Integral PROFINET interface
- Combined MPI / PROFIBUS DP-master/slave interface
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET IO Controller for operating distributed I/O on PROFINET

Micro Memory Card required for operation of CPU.

Application

The CPU 315-2 PN/DP is a CPU with a medium-sized program memory. It is used in installations which have distributed automation structures in addition to a centralized I/O. It can be used as a PROFINET IO Controller and as a standard PROFIBUS DP master in the SIMATIC S7-300. The 315-2 PN/DP CPU can also be used as distributed intelligence (DP slave).

The CPU 315-2 PN/DP is an ideal platform for simple technology tasks implemented in software, e.g.:

- Controlling motion with Easy Motion Control.
- Solving closed-loop control tasks with STEP 7 blocks or the runtime software Standard PID Control/Modular PID Control

Extended process diagnostics are possible using SIMATIC S7-PDIAG.

The integrated combination possibilities of the CPU allow networked automation solutions to be implemented without the need for additional components.

Design

The CPU 315-2 PN/DP is equipped with the following:

- Microprocessor;
  the processor achieves an execution time of approximately 100 ns per binary instruction and 3 µs per floating-point operation.
- 128 KB RAM (corresponds to approx. 43 K statements);
  the extensive working memory for execution-related program sections offers sufficient space for user programs. Micro memory cards (8 MB max.) as load memory for the program also allow the project to be stored in the CPU (complete with symbols and comments) which can be used for data archiving and recipe management.
- Flexible expansion;
  up to 32 modules (four-tier configuration).
- Combined MPI/DP interface;
  the first integrated MPI/DP interface can establish up to 16 simultaneous connections to S7-300/400, PGs, PCs and OPs. Among these connections, one is always reserved for PG and another for OP.
  A simple network with up to 32 CPUs can be configured with the MPI by means of "global data communications".
  This interface can be reconfigured from an MPI to a DP interface. The DP interface can be used as a DP master or as a DP slave.
  PROFIBUS DP interface
  the PROFIBUS DP V1 standard is fully supported.
  This increases the scope of DP V1 standard slaves in terms of diagnostics and parameterization capability.
- Ethernet interface;
  the second integrated interface of the CPU 315-2 PN/DP is a PROFINET interface based on Ethernet TCP/IP.
  It supports the following protocols:
  - S7 communication for data communication between SIMATIC controllers;
  - PG/OP communication for programming, start-up and diagnostics through STEP 7;
  - PG/OP communication for interfacing to HMI and SCADA;
  - Open TCP/IP communication over PROFINET and SIMATIC NET OPC server for communication with other controllers and I/O devices with a separate CPU

Function

- Password protection;
  a password concept also protects the user program from unauthorized access
- Diagnostics buffer;
  the last 100 errors and interrupt events are saved in a buffer for diagnostics purposes
- Maintenance-free data backup;
  the CPU automatically saves all data in case of power failure, so that it remains available unchanged when the power is turned on again.

Programmable features

STEP 7 can be used to parameterize both S7 configurations and the properties and responses of the CPUs:

- Interface with multipoint capability (MPI);
  definition of station addresses.
- Restart/cycle performance characteristics;
  definition of maximum cycle time and cycle loading.
- Clock bit memory;
  address settings.
- Protection level;
  setting of the access privileges for program and data.
- System diagnostics;
  setting of handling and scope of diagnostic messages.
- Time interrupts;
  setting of periodic occurrence.
- Time-of-day interrupts;
  start date, start time and periodicity settings.
- PROFIBUS DP master/slave interface;
  free assignment of addresses for distributed I/O.

Display and information functions

- Status and error displays;
  LEDs indicate hardware, programming, time or I/O errors or bus errors and RUN/STOP modes, restart, and the like.
- Testing functions;
  the PG can be used to display signal states in program execution, modify process tags irrespective of the user program, and read out the contents of stack memories.
- Information functions;
  by means of the PG, the user can obtain information about the memory capacity and operating mode of the CPU, the current workload of the working and load memories, current scan cycle times and diagnostic buffer contents in plaintext.

Integrated communications functions

- PG/OP communication
- Global data communication
- S7 standard communication
- S7 communication
- Open communication over TCP/IP
- PROFINET CBA

System functions

The CPU offers a wide range of system functions for diagnosis, parameterization, synchronization, alarm signaling, time measurement, etc.

For further details, see manual.

Technical specifications

	6ES7 315-2EG10-0AB0
Product version	
• Associated programming package	STEP 7 V5.3 SP1
Supply voltages	
Rated value	
- 24 V DC	Yes
- permissible range, lower limit (DC)	20.4 V
- permissible range, upper limit (DC)	28.8 V
Voltages and currents	
• External fusing for supply lines (recommendation)	Min. 2 A
Current consumption	
• Inrush current, typ.	2.5 A
• I^2t	1 A^2s
• Current consumption (idling), type	100 mA
• Power dissipation, typical	3.5 W
Memory/backup	
Memory	
• Working memory	
- integral	128 Kbyte
- expandable	No
• Load memory	
- pluggable (MMC)	Yes
- pluggable (MMC), max.	8 MByte
- expandable FEPROM	connectable using MMC
Backup	
- available	Yes; guaranteed by MMC (maintenance-free)
CPU/blocks	
DB	
- Number, max.	1,023; from DB 1 to DB1023
- Size, max.	16 Kbyte
FB	
- Number, max.	2,048; from FB 0 to FB 2047
- Size, max.	16 Kbyte
FC	
- Number, max.	2,048; from FC 0 to FC 2047
- Size, max.	16 Kbyte
OB	
- Size, max.	16 Kbyte
Nesting depth	
- per priority class	8
- additional levels within an error OB	4
CPU/processing times	
• for bit instruction, min.	0.1 µs
• for word instruction, min.	0.2 µs
• for integer math, min.	2 µs
• for floating-point math, min.	3 µs

CPU 315-2 PN/DP

Technical specifications (continued)

	6ES7 315-2EG10-0AB0
Timers/counters and their retentive characteristics	
S7 counter	
- Number	256
• of which retentive without battery	
- adjustable	Yes
• Retentivity	
- adjustable	Yes
• Counting range	
- adjustable	Yes
- lower limit	0
- upper limit	999
IEC counter	
- available	Yes
- Type	SDB
S7 times	
- Number	256
• Retentivity	
- adjustable	Yes
- preset	No retention
• Timing range	
- lower limit	10 ms
- upper limit	9,990 s
IEC timer	
- available	Yes
- Type	SFB
Data areas and their retentive characteristics	
Flags	
- Number	2,048 byte
- adjustable retentivity	Yes; MB 0 to MB 2047
- Number of clock memories	8; 1 memory byte
Data blocks	
- Number, max.	1,023; from DB 1 to DB 1023
- Size, max.	16 Kbyte
Local data	
- per priority class, max.	128 byte
Address area	
I/O address area	
- Inputs	2,048 byte
- Outputs	2,048 byte
• of which distributed	
- Inputs	2 Kbyte
- Outputs	2 Kbyte
Process image	
- Inputs	128 byte
- Outputs	128 byte
Digital channels	
- Inputs	16,384
- Outputs	16,384
- Inputs, of which central	1,024; max.
- Outputs, of which central	1,024; max.
Analog channels	
- Inputs	1,024
- Outputs	1,024
- Inputs, of which central	256
- Outputs, of which central	256

	6ES7 315-2EG10-0AB0
Configuration	
• Racks, max.	4
• Modules per rack, max.	8
Number of DP masters	
- integral	1
- via CP	4
Number of FMs and CPs that can be operated (recommendation)	
- FM	8
- CP, point-to-point	8
- CP, LAN	10
Time	
Clock	
- Hardware clock (realtime clock)	Yes
- buffered	Yes
- Deviation per day, max	10 s
Run-time meter	
- Quantity	1
- Number	0
- Range of values	2 to 31 hours (when using SFC 101)
- Granularity	1 hour
- retentive	Yes; must be restarted on each complete restart.
Time synchronization	
- supported	Yes
- on MPI, master	Yes
- on MPI, slave	Yes
- in AS, master	Yes
- in AS, slave	Yes
S7 message functions	
• Number of stations that can log on for message functions, max.	16; (depending on the connections configured for PG/OP and S7 basic communication)
• Process diagnostic messages	Yes
• simultaneously active Alarm-S blocks, max.	40
Test and startup functions	
Status/modify	
- Variable	Yes
- Variables	Inputs, outputs, flags, DB, timers, counters
- Number of variables, max.	30
- of which status variables, max.	30
- of which modify variables, max.	14
Forcing	
- Forcing	Yes
- Forcing, variables	Inputs, outputs
- Forcing, number of variables, max.	10
• Status block	Yes
• Single step	Yes
• Number of breakpoints	2
Diagnostic buffer	
- available	Yes
- Number of inputs, max.	100
- adjustable	No

Technical specifications (continued)

	6ES7 315-2EG10-0AB0
Communication functions	
• PG/OP communication	Yes
• Routing	Yes
Global data communication	
- supported	Yes
- Size of GD packets, max.	22 byte
S7 basic communication	
- supported	Yes
S7 communication	
- supported	Yes
S5 compatible communication	
- supported	Yes; (via CP and loadable FB)
Open IE Communication	
- TCP/IP	Yes; via integrated PROFINET interfaces and loadable FBs
- Number of connections, max.	8
- Data length, max.	1,460 byte
Number of connections	
- overall	16
- usable for PG communication	15; max.
- usable for OP communication	15
- usable for S7 basic communication	14
PROFINET CBA (at 50 % Communication Load)	
- Number of remote interconnection nodes	32
- Sum of all Master/Slave connectors	1,000
- Data length of all input Master/Slave connectors	4,000 byte
- Data length of all output Master/Slave connectors	4,000 byte
- Data length for arrays and structures (acyclic interconn.), max.	1,400 byte
- Data length for arrays and structures (cyclic interconn.), max.	450 byte
- Data length for arrays and structures (local interconn.), max.	128 byte; Slave-dependent
• Remote interconnections with acyclic transmission	
- Sample frequency: sample nterval, min.	500 ms
- Number of input interconnections	100
- Number of output interconnections	100
- Data length of all input interconnections	2,000 byte
- Data length of all output interconnections	2,000 byte
• Remote interconnections with cyclic transmission	
- Transmission frequency: transmission interval, min.	10 ms
- Number of input interconnections	200
- Number of output interconnections	200
- Data length of all input interconnections	2,000 byte
- Data length of all output interconnections	2,000 byte

	6ES7 315-2EG10-0AB0
• HMI variables via PROFINET (acyclic)	
- No. of stations that can log on simultaneously for HMI variab	3; 2 * PN OPC / 1 * iMap
- Update HMI variables	500 ms
- Number of HMI variables	200
- Data length of all HMI variables	2,000 byte
• PROFIBUS Proxy Functionality	
- supports	Yes
- Number of coupled PROFIBUS devices	16
- Number of device internals and PROFIBUS interconnections	500
- Data length of all device internals and PROFIBUS interconn.	4,000 byte
1st interface	
• Type of interface	integrated RS 485 interface
• Physical	RS 485
• Isolated	Yes
• Power supply to interface (15 to 30 V DC), max.	200 mA
Functionality	
- MPI	Yes
- DP master	Yes
- DP slave	Yes
- Point-to-point connection	No
MPI	
- Number of connections	16
• Services	
- PG/OP communication	Yes
- Routing	Yes
- Global data communication	Yes
- S7 basic communication	Yes
- S7 communication	Yes
- S7 communication, as client	Yes; (via CP and loadable FB)
- S7 communication, as server	Yes
- Transmission rates, max.	12 Mbit/s
DP master	
• Services	
- PG/OP communication	Yes
- Routing	Yes
- Global data communication	No
- S7 basic communication	No
- S7 communication	No
- Equidistance support	Yes
- SYNC/FREEZE	Yes
- DPV1	Yes
- Transmission rates, max.	12 Mbit/s
- Number of DP slaves, max.	124
DP slave	
• Services	
- Routing	Yes; only for an active interface
- Global data communication	No
- S7 Basic communication	No
- S7 communication	No
- Direct data exchange (lateral communication)	Yes
- DPV1	No
- Transmission rates, max.	12 Mbit/s

CPU 315-2 PN/DP

Technical specifications (continued)

	6ES7 315-2EG10-0AB0
• Intermediate memory	
- Inputs	244 byte
- Outputs	244 byte
- Address areas, max.	32; with max. 32 byte each
2nd interface	
• Type of interface	PROFINET
• Physical	RJ45
• Isolated	Yes
• Power supply to interface (15 to 30 V DC), max.	0 mA
• Automatic transmission speed detection	Yes; (10/100 Mbit/s)
Functionality	
- MPI	No
- DP master	No
- DP slave	No
- Point-to-point connection	No
- PROFINET CBA	Yes
- PROFINET IO-Controller	Yes
PROFINET CBA	
- acyclic transmission	Yes
- cyclic transmission	Yes
PROFINET IO-Controller	
• Services	
- PG/OP communication	Yes
- Routing	Yes
- S7 communication	Yes; with loadable FBs, max. configurable connections: 16
- Open IE Communication	Yes; via TCP/IP
- Transmission rates, max.	100 Mbit/s
- Number connectable IO devices, max.	128
- Update time	1 - 512 ms, (Min. value depends on the communications components set for PROFINET I/O, on the number of I/O devices and on the number of configured user data)
• Address area	
- Inputs, max.	8 Kbyte
- Outputs, max.	8 Kbyte
- User data consistency, max.	256 byte
CPU/ programming	
Programming language	
- STEP 7	Yes; as of V 5.3 SP1
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
- HiGraph®	Yes
Software library	
• Instruction set	see instruction list
• Bracket levels	8
• User program protection/ password protection	Yes
• System functions (SFC)	see instruction list
• System function blocks (SFB)	see instruction list
Dimensions and weight	
• Weight, approx.	460 g
• Width	80 mm
• Height	125 mm
• Depth	130 mm

Ordering data

		Order No.
CPU 315-2 PN/DP 128 KB main memory, 24 V DC supply voltage, combined MPI/PROFIBUS DP-master/slave interface, Ethernet/Profinet interface; MMC is necessary		**6ES7 315-2EG10-0AB0**
Micro Memory Card		
• 64 KB		**6ES7 953-8LF11-0AA0**
• 128 KB		**6ES7 953-8LG11-0AA0**
• 512 KB		**6ES7 953-8LJ11-0AA0**
• 2 MB		**6ES7 953-8LL11-0AA0**
• 4 MB		**6ES7 953-8LM11-0AA0**
• 8 MB		**6ES7 953-8LP11-0AA0**
MPI cable For connecting SIMATIC S7 and the PG through MPI; length 5 m		**6ES7 901-0BF00-0AA0**
Mounting location number plates		**6ES7 912-0AA00-0AA0**
S7-300 Manual Design, CPU data, module data, command list		
• German		**6ES7 398-8FA10-8AA0**
• English		**6ES7 398-8FA10-8BA0**
• French		**6ES7 398-8FA10-8CA0**
• Spanish		**6ES7 398-8FA10-8DA0**
• Italian		**6ES7 398-8FA10-8EA0**
SIMATIC Manual Collection Electronic manuals on CD-ROM, 5 languages: S7-200/300/400, C7, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering Software, Runtime Software, PCS 7, SIMATIC HMI, SIMATIC NET	D	**6ES7 998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Up-to-date Manual Collection CD as well as the three subsequent updates	D	**6ES7 998-8XC01-8YE2**
Power supply connector For compact CPUs, innovated standard CPUs and CPU 315F-2 DP (10 items, spare part)		**6ES7 391-1AA00-0AA0**
Labeling strips For compact CPUs, standard CPUs as well as CPU 315F-2 DP (10 items, spare part)		**6ES7 392-2XX00-0AA0**
Label cover For compact CPUs, standard CPUs as well as CPU 315F-2 DP (10 items, spare part)		**6ES7 392-2XY00-0AA0**
S7 SmartLabel Software for labeling modules mechanically directly in the STEP 7 project		**2XV9 450-1SL01-0YX0**

D) Subject to export regulations: AL: N and ECCN: 5D992B1

Ordering data	Order No.
Sheets of labels for machine inscription	
For 16-channel signal modules, DIN A4, for printing using a laser printer; 10 items	
• Petrol	**6ES7 392-2AX00-0AA0**
• Light beige	**6ES7 392-2BX00-0AA0**
• Yellow	**6ES7 392-2CX00-0AA0**
• Red	**6ES7 392-2DX00-0AA0**
For 32-channel signal modules, DIN A4, for printing using a laser printer; 10 items	
• Petrol	**6ES7 392-2AX10-0AA0**
• Light beige	**6ES7 392-2BX10-0AA0**
• Yellow	**6ES7 392-2CX10-0AA0**
• Red	**6ES7 392-2DX10-0AA0**
IE FC RJ45 Plug 180	
RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1 901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1 901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1 901-1BB10-2AE0**
PROFIBUS DP bus connector RS 485	
• With 90° cable outlet, max. transmission rate 12 Mbit/s	
- Without PG interface	**6ES7 972-0BA12-0XA0**
- With PG interface	**6ES7 972-0BB12-0XA0**
• With 90° cable outlet for Fast-Connect connection technique, max. transmission rate 12 Mbit/s	
- Without PG interface	**6ES7 972-0BA50-0XA0**
- With PG interface	**6ES7 972-0BB50-0XA0**
• With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	**6GK1 500-0EA02**

	Order No.
IE FC TP Standard Cable GP 2 x 2 (Type A)	**6XV1 840-2AH10**
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m	
IE FC TP Flexible Cable GP 2 x 2 (Type B)	**6XV1 870-2B**
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug for occasional movement; PROFINET-compatible; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m	
IE FC TP Trailing Cable GP 2 x 2 (Type C)	**6XV1 870-2D**
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug for use in trailing cables; PROFINET-compatible; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m	
IE FC TP Trailing Cable 2 x 2 (Type C)	**6XV1 840-3AH10**
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 for use in trailing cables; PROFINET-compatible; without UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m	
IE FC TP Torsion Cable GP 2 x 2 (Type C)	**6XV1 870-2F**
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug for use with robots; PROFINET-compatible; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m	
IE FC TP Marine Cable 2 x 2 (Type B)	**6XV1 840-4AH10**
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90; marine approval; max. quantity 1000 m, minimum order 20 m	
IE TP Cord	See Catalog IK PI 2005, Section 2
PROFIBUS FastConnect bus cable	**6XV1 830-0EH10**
Standard type specially designed for quick installation, 2-core, shielded, sold by the meter; max. length supplied 1000 m, minimum order quantity 20 m	
Repeater RS 485 for PROFIBUS	**6ES7 972-0AA01-0XA0**
Transmission rate of up to 12 Mbit/s 24 V DC; IP20 casing	
PROFIBUS bus components	See Catalogs IK PI and CA 01
For establishing MPI/PROFIBUS communication	

SIMATIC WinAC Software PLC

Overview

PN CBA	PN IO-C	PN IO-D	IRT		
●					

- Optimized for applications that demand high flexibility and integration capability.
- SIMATIC WinAC software PLCs comprise the following products
  - WinAC Basis and
  - WinAC RTX.
- WinAC RTX:
  - The software solution for tasks that demand a highly deterministic response and high performance.
  - With real-time extension to provide deterministic behavior for the control unit.
- WinAC Basis:
  - The low-cost solution for PC-based control tasks.
  - For data-intensive processes in connection with extensive PC tasks.

Application

WinAC software PLCs are particularly suited to tasks requiring a high level of flexibility and effective integration in the overall solution. Examples include close links with data processing and logistics systems and integration of technological tasks, such as motion or vision systems.

SIMATIC WinAC RTX is at your service when you need strict real time and high performance. The optimized runtime system supports the processing of extensive and demanding PC applications in parallel with the control task. NEW
Compared to its predecessor, the new Version WinAC RTX offers a significant increase in speed. Existing programs execute with load on the processor reduced by up to 85 %. This means that either lower-cost PC platforms can be used for the same tasks or further tasks can be performed with the same PC. WinAC RTX 2005 is therefore optimized for operation on embedded PC platforms, such as Microbox PC 420. Microbox PC 420 offers, thanks to its fan-free and hard-disk-free design, significantly greater ruggedness for automation tasks. Support for the integrated PROFIBUS and Ethernet interfaces of the SIMATIC PCs as well as the enhanced performance results in an excellent price/performance ratio for PC-based automation.

SIMATIC WinAC Basis is used where the emphasis is on cost-effective solutions for control tasks together with typical PC tasks. Thanks to high-speed program execution and the high data volume that can be processed, WinAC Basis is ideally suited to coordinating the different automation tasks in a plant.

WinAC ODK is used to extend PLC functionality with application-specific C/C++ applications. This allows:

- Integration of complex high-level language algorithms into the control program.
- Access to Windows API or Windows system resources.
- Access to external hardware and software components.

Design

SIMATIC WinAC software PLCs each comprise the following components:

- Windows logic controller
- Real-time core to ensure real time and a deterministic response (WinAC RTX only).
- OPC server and ActiveX components
- Driver for PROFIBUS CPs
- VenturCom RTX real-time kernel (WinAC RTX only)

Optional:

- CP for connecting to PROFIBUS DP:
  - CP 5611 or the integrated PROFIBUS interface of the SIMATIC PC
  - CP 5613 A2
- SIMATIC WinAC PN option
  - Supports communication between WinAC Basis and further automation devices based on PROFINET CBA over Industrial Ethernet.
- WinAC Open Development Kit (ODK):
  - For using C/C++ code in WinAC Basis or WinAC RTX
  - For integrating external software (technology programs) or PC components (e.g. scanners, PC cards for measured data acquisition)

Function

Windows logic controller (WinLC)

The Windows logic controller takes care of the actual control task and the execution of the control program. It coordinates the necessary input and output of process values via the lower-level PROFIBUS fieldbus system and provides the process values for visualization and data processing tasks.

Several processing levels are available for optimum process control:

- Cyclical program execution
- Alarm processing
- Time and date-controlled execution
- WinAC RTX also features: Isochrone processing level to PROFIBUS if it is operated equidistantly.

The complete retentivity of all process values from WinAC is possible using a standard UPS.

WinAC OPC server

The SIMATIC NET OPC server supplied with WinAC allows open access to all process values. This interface allows any visualization or data processing system to be linked to WinAC.

SIMATIC WinAC PN option

With the WinAC PN option, WinAC Basis can be used as an automation component based on PROFINET CBA and therefore supports data communication with other devices with PROFINET CBA capability over Industrial Ethernet. This opens up the following additional applications for WinAC Basis:

- Coordination and linking of machines and subsystems that have to be interconnected to form a complex overall plant.
- Control of a machine or subsystem that has to be integrated into an overall plant.
- PN proxy functionality for PROFIBUS devices that are connected to the PROFIBUS line of WinAC Basis.

Configuration of data communication between components that is based on PROFINET CBA is performed using the SIMATIC iMap engineering tool.

Interfacing to visualization

WinAC is operated easily using the SIMATIC HMI systems SIMATIC WinCC flexible or SIMATIC WinCC.

Non-Siemens visualization systems can be connected by means of the SIMATIC NET OPC server, which is supplied as standard.

Communication

Programming of Windows Logic Controllers with STEP 7 as well as visualization with SIMATIC HMI can be performed locally on the same PC as well as decentrally over the usual SIMATIC networks Ethernet or PROFIBUS.

WinAC Software PLCs can exchange data with other WinAC stations or with S7 PLCs over these networks.

Technical specifications

	6ES7 671-0CC03-0YA0	6ES7 671-0RC05-0YA0 NEW
Memory/backup		
Memory		
• Working memory		
- integral	PC working memory usable	
• Load memory		
- integral RAM, max.	PC working memory usable	
CPU/blocks		
DB		
- Number, max.	Limited only by the the amount of available PC working memory	
- Size, max.	64 Kbyte	64 Kbyte
FB		
- Number, max.	Limited only by the the amount of available PC working memory	
- Size, max.	64 Kbyte	64 Kbyte
FC		
- Number, max.	Limited only by the the amount of available PC working memory	
- Size, max.	64 Kbyte	64 Kbyte
OB		
- Size, max.	64 Kbyte	64 Kbyte
Nesting depth		
- per priority class	24	24
- additional levels within an error OB	24	24
CPU/processing times		
• for bit instruction, min.	0.013 µs; typ.	0.004 µs
• for integer math, min.	0.025 µs; typ.	0.003 µs
• for floating-point math, min.	0.025 µs; typ.	0.004 µs
• Reference platform	Pentium IV, 2.4 GHz	Pentium IV, 2.4 GHz
Timers/counters and their retentive characteristics		
S7 counter		
- Number	512	512
• Retentivity		
- adjustable	Yes	Yes
- lower limit	0	0
- upper limit	511	511
- preset	8	8
• Counting range		
- adjustable	Yes	Yes
- lower limit	0	0
- upper limit	999	999
IEC counter		
- available	Yes	Yes
- Type	SFB	SFB
- Windows XP	Yes; Professional, SP1	Yes; Professional, SP1

3

Technical specifications (continued)

	6ES7 671-0CC03-0YA0	6ES7 671-0RC05-0YA0 NEW
S7 times		
- Number	512	512
• Retentivity		
- lower limit	0	0
- upper limit	511	511
- preset	0	0
• Timing range		
- lower limit	10 ms	10 ms
- upper limit	9,990 s	9,990 s
IEC timer		
- available	Yes	Yes
- Type	SFB	SFB
Data areas and their retentive characteristics		
• Retentivity without UPS and PS extension board	none	none
• Retentivity with UPS	all data	all data
Flags		
- Number	2 Kbyte	16 Kbyte
- of which retentive	MB 0 - MB 2048	MB 0 - MB 16383
- preset retentivity	MB 0 to MB 15	MB 0 to MB 15
- Number of clock memories	8	8
Address area		
I/O address area		
- Inputs	16 Kbyte	16 Kbyte
- Outputs	16 Kbyte	16 Kbyte
• of which distributed		
- DP interface, inputs	16 Kbyte	16 Kbyte
- DP interface, outputs	16 Kbyte	16 Kbyte
Process image		
- Inputs, adjustable	8 Kbyte	8 Kbyte
- Outputs, adjustable	8 Kbyte	8 Kbyte
- Inputs, preset	512 byte	512 byte
- Outputs, preset	512 byte	512 byte
- Number of component process images, max.	15	15
Digital channels		
- Inputs	131,072	131,072
- Outputs	131,072	131,072
Analog channels		
- Inputs	8,192	8,192
- Outputs	8,192	8,192
Configuration		
Number of DP masters		
- via CP	CP 5611 Integrated PB interface of the SIMATIC PC CP 5613 CP 5613-A2	
Number of FMs and CPs that can be operated (recommendation)		
- FM	FM distributed: FM350-1/350-2, FM 351, FM 352, FM 353, FM 354, FM 355, FM 355-2	
- CP, point-to-point	CP340, CP341 distributed	
- CP, LAN	via PC-CP	

	6ES7 671-0CC03-0YA0	6ES7 671-0RC05-0YA0 NEW
Time		
Clock		
- Hardware clock (realtime clock)	Yes	Yes
- buffered	Yes	Yes
Time synchronization		
- supported	No	Yes
- on PC-CP, slave		Yes
S7 message functions		
• Number of stations that can log on for message functions, max.	64	64
• SCAN method	No	No
• Process diagnostic messages	Yes; Alarm_S	Yes
• Alarm 8 blocks	No	Yes
• Statuses	No	No
Test and startup functions		
Status/modify		
- Variable	Yes	Yes
Forcing		
- Forcing	No	No
• Status block	Yes	Yes
• Single step	Yes	Yes
Diagnostic buffer		
- available	Yes	Yes
- Number of inputs, max.	3,200	3,200
- preset	120	120
Communication functions		
• PG/OP communication	Yes	Yes
Global data communication		
- supported	No	No
S7 basic communication		
- supported	No	No
S7 communication		
- as server	Yes	Yes
- as client	Yes	Yes
Number of connections		
- overall	64	64
- reserved for PG communication	1	1
- reserved for OP communication	1	1
1st interface		
• Type of interface	CP5611, SIMATIC PC integral	CP5611, SIMATIC PC integral
• Number of simultaneous operable CPs, max.	1	1
• Physical	RS 485 / PROFIBUS	RS 485 / PROFIBUS
• Isolated	Yes	Yes
Functionality		
- MPI	No	No
- DP master	Yes	Yes
- DP slave	No	No

Technical specifications (continued)

	6ES7 671-0CC03-0YA0	6ES7 671-0RC05-0YA0 NEW
DP master		
- Number of connections, max.	8	8
• Services		
- PG/OP communication	Yes	Yes
- Routing	Yes	Yes
- Global data communication	No	No
- S7 basic communication	No	No
- S7 communication	Yes	Yes
- Equidistance support	No	No
- SYNC/FREEZE	Yes	Yes
- Activate/deactivate DP slaves	Yes	Yes
- Direct data exchange (lateral communication)	Yes	Yes
- DPV0	Yes	Yes
- DPV1	No	Yes
- Transmission rates, max.	12 Mbit/s	12 Mbit/s
- Number of DP slaves, max.	32	64
• Address area		
- Inputs, max.	16 Kbyte	16 Kbyte
- Outputs, max.	16 Kbyte	16 Kbyte
• User data per DP Slave		
- Inputs, max.	244 byte	244 byte
- Outputs, max.	244 byte	244 byte
2nd interface		
• Type of interface	CP5613, CP 5613-A2	CP 5613, CP 5613-A2
• Number of simultaneous operable CPs, max.	4	4
• Physical	RS 485 / PROFIBUS	RS 485 / PROFIBUS
• Isolated	Yes	Yes
Functionality		
- MPI	No	No
- DP master	Yes	Yes
- DP slave	No	No
- PROFINET CBA		No
- PROFINET CBA-SRT		No
- PROFINET IO-Controller		No
DP master		
- Number of connections, max.	50	50
• Services		
- PG/OP communication	Yes	Yes
- Routing	Yes	Yes
- Global data communication	No	No
- S7 basic communication	No	No
- S7 communication	Yes	Yes
- Equidistance support	Yes	Yes
- SYNC/FREEZE	Yes	Yes
- Activate/deactivate DP slaves	Yes	Yes
- Direct data exchange (lateral communication)	Yes	Yes
- DPV0	Yes	Yes
- DPV1	Yes	Yes
- Transmission rates, max.	12 Mbit/s	12 Mbit/s
- Number of DP slaves, max.	125	125

	6ES7 671-0CC03-0YA0	6ES7 671-0RC05-0YA0 NEW
• Address area		
- Inputs, max.	16 Kbyte	16 Kbyte
- Outputs, max.	16 Kbyte	16 Kbyte
• User data per DP Slave		
- Inputs, max.	244 byte	244 byte
- Outputs, max.	244 byte	244 byte
3rd interface		
• Type of interface		Onboard Ethernet interface of SIMATIC PC
Clock synchronism		
• Clock synchronous operation	No	Yes
• Number of DP masters with clock synchronism		2
• User data per clock synchronous slave, max.		128 byte
• Equidistance		Yes
• Shortest clock pulse		2.2 ms
CPU/ programming		
Programming language		
- STEP 7	Yes; as of V5.2, engineering tools (optional)	Yes
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- CFC	Yes	Yes
- GRAPH	Yes	Yes
- HiGraph®	Yes	Yes
Software library		
- Easy Motion Control	Yes	Yes
• Bracket levels	8	8
• User program protection/password protection	No	No
Open development interfaces		
- CCX (Custom Code Extension)	Yes; with WinAC ODK V4.1	Yes
- SMX (Shared Memory Extension)	Yes; with WinAC ODK V4.1	Yes
- Inputs	4 Kbyte	4 Kbyte
- Outputs	4 Kbyte	4 Kbyte
- CMI (Controller Management Interface)	Yes; with WinAC ODK V4.1	Yes
Hardware requirements		
• Required hardware	PC with color monitor, keyboard, mouse or pointing device for Windows	PC with color monitor, keyboard, mouse or pointing device for Windows
• required memory on hard disk, min.	100 MByte	100 MByte
• Main memory, min.	128 MByte	128 MByte
• Processor	Intel Pentium 800 MHz	
Software requirements		
Operating system		
- Windows NT 4.0	No	No
- Windows 2000	Yes; Professional, >=SP3	Yes
- Windows XP	Yes; Professional, SP1	Yes

SIMATIC WinAC Software PLC

Ordering data		Order No.
SIMATIC WinAC RTX 2005 Software-based PC-based control system for tasks with hard deterministics; CD-ROM with electronic documentation in German, English, French; single license, runs under Windows 2000/XP	B	**6ES7 671-0RC05-0YA0** NEW
SIMATIC WinAC RTX 2005 upgrade For upgrading from V4.0, V4.1 to 2005; single license, runs under Windows 2000/XP	B	**6ES7 671-0RC05-0YE0** NEW
SIMATIC WinAC Basis V4.1 Software-based PC-based control system; CD-ROM with electronic documentation in German, English, French; single license, runs under Windows 2000/XP	B	**6ES7 671-0CC03-0YA0**
SIMATIC WinAC Basis upgrade Upgrade from V4.0 to V4.1; single license, runs under Windows 2000/XP	B	**6ES7 671-0CC03-0YE0**
SIMATIC WinAC PN Option V4.1 For using WinAC Basis for Component Based Automation, based on the PROFINET communication standard; single license, runs under Windows 2000/XP	B	**6ES7 671-0CC03-2YA0**
CP 5613 A2 communications processor PCI card (32 bit; 3.3 V/5 V) for connecting to PROFIBUS including DP base software with NCM PC; DP RAM interface for DP master, including PG and FDL protocol; single license for 1 installation, runtime software, software and electronic manual on CD-ROM, Class A, for 32 bit Windows 2000 Professional/Server; Windows XP Professional, German/English	D	**6GK1 561-3AA01**
CP 5611 communications processor PCI card (32 bit) for connecting a PG or PC to PROFIBUS		**6GK1 561-1AA00**

B) Subject to export regulations: AL: N and ECCN: EAR99S
D) Subject to export regulations: AL: N and ECCN: 5D992B1

Overview

PN	ISO	TCP	UDP	S7	S5	IT	FTP	PG/OP
●	●	●	●	●	●			●

PN CBA	PN IO-C	PN IO-D	IRT		
avail. soon	●				

- Connection of SIMATIC S7-300 to Industrial Ethernet
  - 10/100 Mbit/s full/half duplex connection with autosensing
  - Connection for RJ45
  - Multi-protocol operation with TCP and UDP transport protocol
  - Adjustable Keep Alive function
- Communication services:
  - PROFINET IO Controller
  - TCP/IP und UDP transport protocol
  - Programming device/operator panel communication: Cross-network by means of S7 routing
  - S7 communication (client, server, multiplexing)
  - S5-compatible communication
- Multicast for UDP
- IP address assignment via DHCP, simple PC tool or via the user program (e.g. HMI)
- Access protection by means of configurable access list
- Remote programming and initial startup via the network
- Automatic setting of the CPU clock via Ethernet with NTP or SIMATIC procedure
- SNMP MIB2 diagnostics information for network management systems

Benefits

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- Connection of field devices to Industrial Ethernet with PROFINET
- Investment protection for existing plants through the integration of the SIMATIC S7-300 by means of the S5-compatible communication
- Security;
  protection without changing passwords, through device-related IP address lists
- Remote programming is possible due to the WAN characteristic of TCP/IP, even via the telephone network (e.g. ISDN)
- Setting of intrinsic IP parameters of series machines without STEP 7
- Plant-wide time synchronization via NTP or SIMATIC procedure
- Accessibility of many nodes by means of free UDP connections or multicast function
- Active transmission of data with S7 communication
- Access by as many as 16 HMI systems to the SIMATIC S7-300
- Use of the socket interface in the partner system possible without RFC 1006

Application

The CP 343-1 is the communications processor for connecting SIMATIC S7-300 to Industrial Ethernet.

With its own processor, it relieves the CPU of communications tasks and facilitates additional connections.

The CP 343-1 offers the communication options of the S7-300:

- PG/PC
- HMI devices
- SIMATIC S5/S7/C7 systems
- PROFINET IO devices

Design

The CP 343-1 offers all the advantages of SIMATIC S7-300 system design:

- Compact design;
  the rugged plastic casing features on the front:
  - automatic transmission rate detection through autosensing;
  - RJ45 socket for connection to Industrial Ethernet.
  - 2-pin plug-in terminal block for connecting the external supply voltage of 24 V DC
- Simple assembly;
  The CP 343-1 is mounted on the S7-300 DIN rail and connected to adjacent modules by means of the bus connectors. There are no slot rules.
- Operation without fans;
  a backup battery is not required.
- With the IM 360/361, the CP 343-1 can also be used in an expansion rack (ER)
- Module replacement possible without PG

CP 343-1

Function

The CP 343-1 independently handles data traffic over Industrial Ethernet. The module has its own processor. Layers 1 to 4 comply with international standards.

Multi-protocol operation of the transport protocols TCP/IP and UDP is possible. For connection control (keep alive) it is possible to configure an adjustable time for all TCP transport connections for active and passive partners.

The CPU's time can be set using NTP or SIMATIC procedures with an accuracy of approx. +/-1 s.

The CP 343-1 has a preset unique Ethernet address and can be put directly into operation over the network.

The CP 343-1 works in multi-protocol mode for the following communication services:

PG/OP communication

PG/OP communication allows all S7 stations connected to the network to be remotely programmed.

- S7 routing;
  using S7 routing it is possible to use programming device communication across networks

PROFINET communication

- *PROFINET IO Controller*;
  real-time communication (RT) with field devices on Industrial Ethernet in accordance with PROFINET standard

S7 communication

For connecting the S7-300 (server and client) to S7-200/300/400 (server and client), HMI units and PCs (CP 1613 with S7-1613 or SOFTNET-S7).

S5-compatible communication

Based on layer 4, this is a simple, optimized interface for data communication. Up to 8 KB of data can be transmitted in one call.

This interface enables

- TCP transport connections
  - TCP with RFC 1006
  - TCP without RFC 1006
- UDP
  - Multicast for UDP

to be used.

S5-compatible communication is used for communication with SIMATIC S5, SIMATIC S7-400/-300 and computers/PCs.

The function blocks required are a component part of NCM S7 for Industrial Ethernet and must be integrated into the S7 user program.

S5-compatible communication with FETCH/WRITE allows direct access to the CPU data of the SIMATIC S5 (e.g. via CP 1430). This means existing HMI systems can still be used.

Implementing UDP as the transmission protocol for S5-compatible communication allows utilization of the multicast function to simultaneously send and receive data on configured multicast circuits.

Diagnostics

Extensive diagnostics options are available via NCM S7, including:

- Operating status of CP
- Operating status of PROFINET IO devices connected to CP
- General diagnostics and statistics functions
- Connection diagnostics
- LAN controller statistics
- Diagnostics Buffer

Diagnostics possibilities during operation

- Status scanning of connections using function block
- SNMP MIB-2 objects;
  the current status of the Ethernet interface can then be called, e.g. for network management.

Security

With a configurable IP access list, specific PCs and automation devices can be released for IP-based access to the CP or controller.

Configuring

Version 5.3 SP2 of STEP 7 and NCM S7 for Industrial Ethernet are required for configuring the CP 343-1. NCM S7 is completely embedded in the STEP 7 environment.

The function blocks required for communication and the programmable communications block (S7-Client) are included in the scope of supply of NCM S7 for Industrial Ethernet or can be downloaded from the Internet.

Technical specifications

	CP 343-1
Transmission rate	10/100 Mbit/s autosensing
Interfaces	
• 10BaseT, 100BaseTX	RJ45
• Connection for power supply	2-pin plug-in terminal strip
Power supply	+5 V DC (±5%) and +24 V DC (±5%)
Current consumption	
• From backplane bus	200 mA
• From 24 V DC external	typ. 160 mA max. 200 mA
Power loss	5.8 W
Perm. ambient conditions	
• Operating temperature	0 °C to +60 °C
• Transport/storage temperature	-40 °C to +70 °C
• Relative humidity	Max. 95% at +25 °C
Construction	
• Module format	Compact module S7-300, double width
• Dimensions (W x H x D) in mm	80 x 125 x 120
• Weight	Approx. 600 g
Configuring software	STEP 7 V5.3 SP2 and higher
Performance data	
S5-compatible communication (SEND/RECEIVE)	
• Sum of all simultaneously operable TCP/UDP connections	Max. 16
• Useful data	
- TCP	8 KB
- UDP	2 KB
S7 communication	
• Number of connections	Max. 16
PG/OP communication	
• Number of operable OP connections (non-isochrone services)	16
Multi-protocol operation	
• Sum of all simultaneously operable connections	Max. 48
Multicast	16
PROFINET communication	
PN IO-Controller	
• Number of operable PN IO-Devices	125
• Size of IO data areas overall	
- I/O input area	2160 byte
- I/O output area	2160 byte
• Size of I/O data areas per connected PN IO-Device	
- I/O input area	Max. 128 byte
- I/O output area	Max. 128 byte

Ordering data

		Order No.
CP 343-1 communications processor For connection of SIMATIC S7-300 to Industrial Ethernet; PROFINET IO-Controller, TCP/IP and UDP, S7 communication, S5-compatible communication (SEND/RECEIVE), FETCH/ WRITE, with and without RFC 1006, diagnostic expansions, multicast, CPU clock synchronization via SIMATIC procedure and NTP, access protection through IP access list, SNMP, DHCP, initialization over LAN 10/100 Mbit/s; with electronic manual on CD-ROM	H	**6GK7 343-1EX21-0XE0**
NCM S7 configuration software for Industrial Ethernet for Industrial Ethernet CPs for SIMATIC S7 V5.3 SP2, operating under STEP 7 V5.3; on CD-ROM with electronic manual in German, English, French, Spanish, Italian		Included in the STEP 7 V5.3 package
IE FC RJ45 Plug 180 RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface		
• 1 pack = 1 unit		**6GK1 901-1BB10-2AA0**
• 1 pack = 10 units		**6GK1 901-1BB10-2AB0**
• 1 pack = 50 units		**6GK1 901-1BB10-2AE0**
Documentation S7-CPs/NCM for Industrial Ethernet and PROFIBUS for V5.x (STEP 7 V5.x); paper version		
• German		**6GK7 080-0AA01-8AA0**
• English		**6GK7 080-0AA01-8BA0**

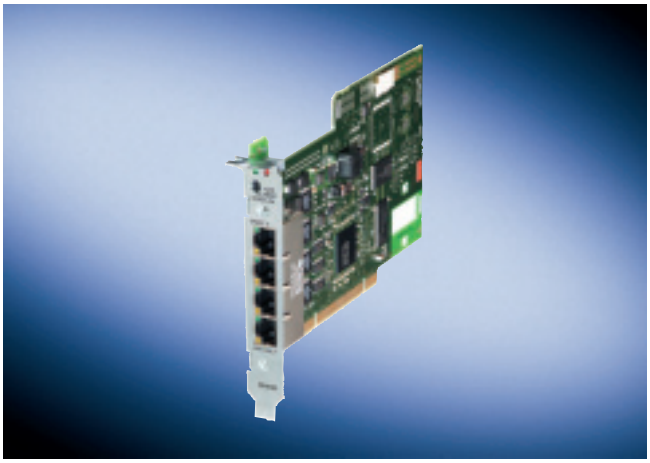
H) Subject to export regulations: AL: N and ECCN: 5A991

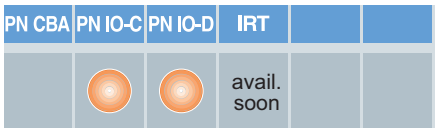
More information

Using firmware which will be available soon, this module can be updated with the current PROFINET CBA version. The CP 343-1 will then contain the functionality of the CP 343-1 PN.

CP 1616

Overview





- PCI module for connecting PCs and SIMATIC PGs/PCs to PROFINET IO
- Full-duplex/half-duplex with autonegotiation (universal key 3.3 V and 5 V; 33 MHz / 66 MHz; 32 bit, executes in 64-bit PCI-X systems)
- With Ethernet real-time ASIC ERTEC 400
- Integral 4-port real-time switch
- Communication services:
  - PROFINET IO controller and/or PROFINET IO device (RT)
  - Support of IRT in Motion Control applications (available soon)
- High performance through direct memory access
- Integration in network management systems through the support of SNMP I (available soon)
- Comprehensive diagnostics possibilities for installation, start-up and operation of the module
- Powerful configuration tools are included in delivery of module

Benefits

get Designed for Industry

- Ideally suitable for design of small local networks through integral 4-port real-time switch
- Connection of field devices to Industrial Ethernet with PROFINET
- Direct memory access to process data by linking as PROFINET IO-Controller via IO-Base interface
- High computing power is available in the PC by taking the load off the host CPU by means of a real-time ASIC ERTEC 400 with support of the PROFINET real-time features RT and IRT (available soon)
- Implementation in Motion Control applications thanks to support of IRT (available soon)
- Simple transfer to various operating system environments using Development Kit DK-16xx PN IO
- Switch mode also with the PC switched off, via optional external power supply
- Uncrossed connecting cables can be used due to the integrated Autocrossover function

Application

The CP 1616 enables SIMATIC PGs/PCs and PCs equipped with a PCI slot to be connected to PROFINET IO.

The CP 1616 provides high-performance support for control tasks on the PC (PC based Control, Numeric Control, Robot Control).

With IRT (Isochronous Real-Time), the CP is ideally suited to time-critical applications that are in the range of strictly isochronous closed-loop control in the motion control sector (available soon).

The integrated 4-port switch supports low-cost system solutions and the configuration of different topologies.

The CP 1616 provides communication functions for SIMATIC programming devices/PCs and industrial PCs:

- PROFINET IO controller and/or PROFINET IO device (RT)

The DK-16xx PN IO development kit enables integration of the module into any operating systems.

Design

- Industrial Ethernet
  - 4 x RJ45 connection
  - Integral 4-port real-time switch for 10/100 Mbit/s Ethernet
  - Half/full duplex
  - Autosensing/Autocrossover
- PCI interface:
  - PCI 2.2
  - 32 bit, for execution in 64-bit PCI X systems
  - 33 MHz or 66 MHz
  - Universal Key 3.3 V and 5 V
  - Installation through PCI standard mechanisms (Plug & Play)
- Host interface/processor:
  - Dual-port RAM on board
  - Flash for program memory on board
  - ARM 946 RISK processor (32 bit) on board for preprocessing
- Power supply:
  - Operating voltage: 5 V through PCI
  - Optional external 6 - 9 V DC supply for switch operation with PC switched off
- Size:
  - Short PCI format

Function

The CP 1616 can be operated as a PROFINET IO controller and/or PROFINET IO device that stores the process image (input and output data) in the memory area on the CP. High-performance data transfer to and from the IO devices is performed autonomously by the CP 1616.

Real-time

Support of real-time properties of PROFINET for RT and IRT (available soon). The real-time properties of the CP 1616 ensure extremely short cycle times with highly accurate clock-pulse rates.

Switching

According to the industry requirements, the 4-port real-time switch additionally permits the configuration of line topologies with spur lines and makes external switch components unnecessary.

The switch function is also available when the PC is turned off thanks to the possibility of independently supplying an external voltage.

Software packages

DK-16xx PN IO development kit;
driver and IO-Base software for CP 1616 as PROFINET IO-Controller and IO-Device under Linux in source code for transfer to any PC-based operating systems with IO-Base interface for:

- PROFINET communication:
  - PROFINET IO controller:
    Connection of field devices to Industrial Ethernet with PROFINET
  - PROFINET IO device:
    Link-up with a PROFINET IO controller through real-time communication according to the PROFINET standard
- Access in isochronous mode to real-time data for PROFINET over IRT (available soon);
  extremely short cycle times with highly accurate clock-pulse rates;
  jitter accuracy, isochronous mode, and cycle time enable high-performance motion control applications (available soon).
- Direct memory access to the process data;
  the process data of the IO-Devices are always consistent.
  The IO programming interface provides the PC programmer with function calls for data transfer.
- The design of the interface not only permits fast access as PROFINET IO controller, but also easy porting to other operating system environments (e.g. VXWorks, QNX, RMOS, RTX).
- The IO-Base interface for the PROFINET IO controller of the CP 1616 is compatible with the interface for SOFTNET PN IO

Using the DK-16xx PN IO, the CP 1616 communications processor can be integrated into any PC-based operating system environments. The development kit contains the driver and IO-Base source code required for this including the transfer instructions, and also the example code which executes with SUSE Linux 9.2.

User interfaces

Programming interface through C library

For applications that want to use the PROFINET IO-Controller or IO-Device functionality directly over C/C++, the IO-Base interface can be used. This interface is of a similar design to the DP Base interface of PROFIBUS modules CP 5613 and CP 5614. It is therefore possible to port existing PROFIBUS DP master applications to PROFINET IO-Controller applications. The following compilers can be used in combination with SIMATIC NET products:

- Microsoft Visual C++ V6.0
- Microsoft Visual C++.NET

Diagnostics

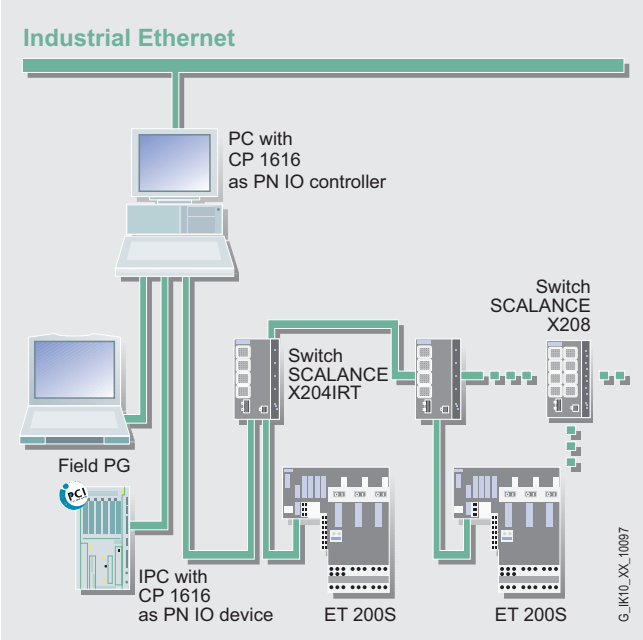
Extensive diagnostic options are available via STEP 7 or SNMP, including:

- General diagnostics functions
- Connection diagnostics
- Diagnostics of the assigned PROFINET field devices
- Integration in network management systems through the support of SNMP I (available soon)

Configuring

Configuration of the CP 1616 is performed with STEP 7/NCM PC, V5.3 SP2 and higher. NCM PC is included with the module.

Integration



CP 1616 as PROFINET IO-Controller and PROFINET IO-Device

CP 1616

3

Technical specifications

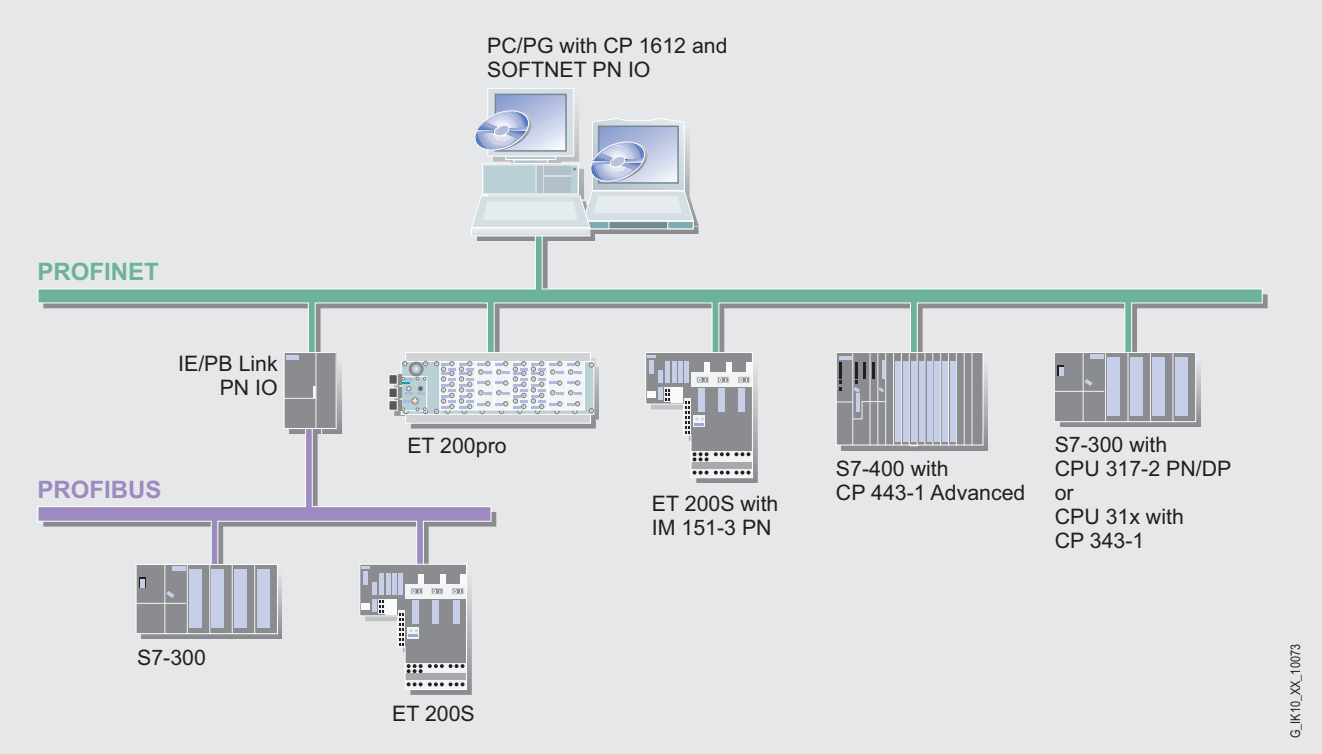
	CP 1616
Transmission rate	10/100 Mbit/s autosensing
Interfaces	
• 10BaseT, 100 BaseTX	4 x RJ45, Autocrossing
• Connection to programming device/PC	PCI 2.2 and PCI-X compatible, 32 bit, executable in 64-bit PCI-X slots, 33 MHz/66 MHz, 3.3 V/5 V universal key
• External supply for switch from standard plug-type power supply unit (optional)	Low-voltage socket for hollow plug 3.5 mm (-) / 1.3 mm (+)
Power supply	
• Internal	5 V DC through PCI
• External	Optional for switch with PC power-down
- Electrical isolation	Required
- Rated voltage range	6 - 9 V DC
Current consumption	
• Internal	Max. 800 mA from PCI 5 V
• External	Optional for switch with PC power-down
- At 6 V DC (optional)	max. 650 mA
- At 9 V DC (optional)	max. 450 mA
Power loss	
• In normal mode (PC on; without external supply)	Approx. 4 W
• In switch mode (PC power down and external supply)	Approx. 3.9 - 4.1 W
Perm. ambient conditions	
• Operating temperature	+5 °C to +55 °C
• Transport/storage temperature	-20 °C to +60 °C
• Relative humidity	Max. 95% at +25 °C
Construction	
• Module format	PCI card, short
• Dimensions (W x D) in mm	107 x 167
• Weight	Approx. 110 g
• Space requirements	1 x PCI slot (32-bit; 3.3 V/5 V)
Processor	ERTEC 400 / ARM9
Performance data	
PN IO-Controller performance data	
Number of operable PN IO-Devices	Max. 64
Size of IO data areas overall	
• I/O input area	Max. 32 KB
• I/O output area	Max. 32 KB
Size of I/O data areas per connected PN IO-Device	
• I/O input area	Max. 1472 byte
• I/O output area	Max. 1472 byte

Ordering data

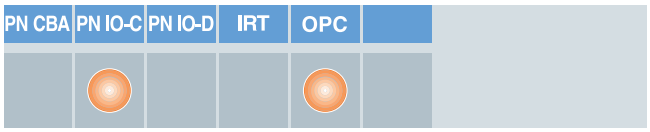
		Order No.
CP 1616 communications processor PCI card (32-bit; 3.3/5 V universal key) with ASIC ERTEC 400 for connecting PCs to PROFINET IO with 4-port real-time switch (RJ45); for use with DK-16xx PN IO development kit; NCM PC	A	**6GK1 161-6AA00**
Accessories		
DK-16xx PN IO development kit Software development kit for CP 1616; driver and IO-Base software for CP 1616 as PROFINET IO-Controller and IO-Device in source code for transfer to other PC-based operating systems; including executable example code for SUSE Linux 9.2	D	**6GK1 741-1HL10-3AA0**
IE FC RJ45 Plug 180 RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface		
1 pack = 1 unit		**6GK1 901-1BB10-2AA0**
1 pack = 10 units		**6GK1 901-1BB10-2AB0**
1 pack = 50 units		**6GK1 901-1BB10-2AE0**

A) Subject to export regulations: AL: 3A001A10B and ECCN: N
D) Subject to export regulations: AL: N and ECCN: 5D992B1

Overview



PC with SOFTNET PN IO as PROFINET IO-Controller



- Software with PROFINET IO-Controller function for coupling PG/PC and IPC with PROFINET IO-Devices
- Possible applications:
  - PC-based control systems
  - HMI systems
  - Test applications
- Communication services:
  - PROFINET IO Controller
- Can be used with
  - CP 1612 (PCI)
  - Integrated interfaces of SIMATIC PG/PC
- Cost-effective solution for the low-end performance range
- OPC server for I/O interfacing over PROFINET included in scope of supply

SOFTNET PN IO Edition 2005

Benefits

get Designed for Industry

- Cost-effective interfacing of field devices with Industrial Ethernet with PROFINET
- Simple porting of the application with OPC as a standard interface
- High-performance IO data access through IO Base interface for linking into C/C++ applications
- Simple migration of PROFIBUS modules CP 5613/CP 5614 with DP base interface to PROFINET through IO-Base interface
- Uniform procedure and configuration functions for NCM PC and STEP 7

Application

OPC FOUNDATION MEMBER

Compliance Tested OPC FOUNDATION

Using SOFTNET PN IO, PCs can be connected to field devices over Industrial Ethernet.

SOFTNET PN IO is available for the following interfaces:

- CP 1612 (PCI)
- Integrated interfaces of SIMATIC PG/PC

Function

PROFINET communication

- *PROFINET IO-Controller*
  Connection of field devices to Industrial Ethernet with PROFINET

User interfaces

- *OPC interface*
  The supplied OPC server can be used as a standard programming interface for PROFINET IO-Controller to link automation applications to OPC-capable Windows applications (Office, HMI systems, etc.).
- *Programming interface through C library;*
  For applications that want to use the PROFINET IO-Controller functionality directly in C/C++, the IO-Base interface can be used. This interface is of a similar design to the DP Base interface of PROFIBUS modules CP 5613 and CP 5614. It is therefore possible to port existing PROFIBUS DP master applications to PN IO-Controller applications. The following compilers can be used in combination with SOFTNET PN IO:
  - Microsoft Visual C/C++ V6.0
  - Microsoft Visual Basic V6.0
  - Microsoft Visual Basic V7.0

SOFTNET PN IO and CP 1616 use compatible functions of the IO-Base interface.

Mode of operation

With SOFTNET, the complete protocol stack is processed in the PC. This architecture means that the performance depends on the configuration of the PC used or the loading on the PC.

Configuring

- Configuration is performed with STEP 7/NCM PC, V5.3 SP1 and higher

Technical specifications

	SOFTNET PN IO
Performance data IO controller	
• Number of operable IO devices	Max. 64
• Number of external IO-lines in one central rack	Max. 1
• Size of IO data areas overall	
- I/O input area	Max. 32 KB
- I/O output area	Max. 32 KB
• Size of I/O data area per connected I/O device	
- I/O input area	Max. 1472 bytes
- I/O output area	Max. 1472 bytes

Ordering data

		Order No.
SOFTNET PN IO Edition 2005 Software for PROFINET I/O controller with OPC server and NCM PC single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server; Windows 2000 Professional, Server for CP 1512 and CP 1612, German/English	D	**6GK1 704-1HW63-3AA0**
CP 1612 communications processor PCI card (32-bit; 3.3 V/5 V) for connecting a programming device or PC to Industrial Ethernet (10/100 Mbit/s), with RJ45 connection incl. driver for 32-bit Windows 98, Me, NT 4.0, WS/Server, 2000 Professional/Server, XP Professional, 2003 Server	A	**6GK1 161-2AA00**

A) Subject to export regulations: AL: N and ECCN: EAR99H
D) Subject to export regulations: AL: N and ECCN: 5D992B1

Overview

Interface modules for handling communication between the ET 200pro and the higher-level programmable logic controller over PROFINET IO.
The IM 154-4PN interface module will be available soon.

Application

The IM 154-4 PN High Feature interface module handles the communication between ET 200pro and the higher-level PLC over PROFINET IO.

Design

The interface module is equipped with a 2-port switch for line-type network topologies and two M12 sockets for communication, as well as a 7/8" socket for the 24 V supply. PROFIsafe applications are also possible in combination with this module.
A Micro Memory Card is necessary for operation of IM 154-4 PN High Feature. This must be ordered separately.

Function

The IM 154-4 PN High Feature interface modules are configured using STEP 7 V5.3 SP3. A GSD file allows it to be integrated into older versions of STEP 7 from V5.3 SP1 and above.

Ordering data

		Order No.
IM 154-4 PN High Feature interface module For communication between ET 200pro and higher-level controllers over PROFINET IO; support of PROFIsafe	A	**6ES7 154-4AB00-0AB0**
Accessories		
M12 covering cap For protection of unused M12 connections with ET 200pro		**3RX9 802-0AA00**
Micro Memory Card, 3.3 V, NFLASH		
• 64 KB		**6ES7953-8LF11-0AA0**
• 128 KB		**6ES7953-8LG11-0AA0**
• 512 KB		**6ES7953-8LJ11-0AA0**
• 2 MB		**6ES7953-8LL11-0AA0**
• 4 MB		**6ES7953-8LM11-0AA0**
• 8 MB		**6ES7953-8LP11-0AA0**
IE M12 connecting cables Pre-assembled with two M12 connectors		
• 0.3 m long		**6XV1 870-8AE30**
• 0.5 m long		**6XV1 870-8AE50**
• 1.0 m long		**6XV1 870-8AH10**
• 1.5 m long		**6XV1 870-8AH15**
• 2.0 m long		**6XV1 870-8AH20**
• 3.0 m long		**6XV1 870-8AH30**
• 5.0 m long		**6XV1 870-8AH50**
• 10 m long		**6XV1 870-8AN10**
• 15 m long		**6XV1 870-8AN15**

		Order No.
7/8" connecting cable to power supply 5-core, 5 x 1.5 mm^2, trailing type, pre-assembled with two 7/8" connectors, 5-pin		
• 1.5 m long		**6XV1 822-5BH15**
• 2.0 m long		**6XV1 822-5BH20**
• 3.0 m long		**6XV1 822-5BH30**
• 5.0 m long		**6XV1 822-5BH50**
• 10 m long		**6XV1 822-5BN10**
• 15 m long		**6XV1 822-5BN15**
Power cables 5-core, 5 x 1.5 mm^2, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1,000 m		**6XV1 830-8AH10**
7/8" cable connector For ET 200eco, with axial cable outlet		
• with male insert, 5 per pack		**6GK1 905-0FA00**
• with female insert, 5 per pack		**6GK1 905-0FB00**
Spare fuse 12.5 A quick-response, for interface and power modules, 10 items per package unit	A	**6ES7 194-4HB00-0AA0**
SIMATIC Manual Collection Electronic manuals on CD, multilingual: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	D	**6ES7 998-8XC01-8YE0**
SIMATIC Manual Collection – Update service for 1 year Scope of delivery: Current CD "S7 Manual Collection" and the three subsequent updates	D	**6ES7 998-8XC01-8YE2**

A) Subject to export regulations: AL: N and ECCN: EAR99H
D) Subject to export regulations: AL: N and ECCN: 5D992B1

IWLAN/PB Link PN IO

Overview

PN CBA	PN IO-C	PN IO-D	IRT	DP-M	PG/OP
		●		●	●

- Compact router between Industrial Wireless LAN and PROFIBUS
- Flexible integration of field level systems into an IWLAN radio infrastructure according to IEEE 802.11b/g and IEEE 802.11a with up to 54 Mbit/s at 2.4 GHz or 5 GHz with SCALANCE W access points
- PROFINET IO proxy;
  connection of PROFIBUS DP slaves to PROFINET IO controller according to PROFINET standard:
  - From the viewpoint of the IO-controller, all DP slaves are handled like I/O devices with Ethernet interface, i.e. the IWLAN/PB Link PN IO is their proxy.
  - From the viewpoint of the DP slaves, the IWLAN/PB Link PN IO is the DP master
- Connection of a WLAN antenna or alternatively an antenna for operation with an RCoax cable (leaky wave conductor)
- Communication with programmable controllers in mobile applications such as automated guided vehicles, storage and retrieval systems or monorail overhead conveyors
- Direct substitution of solutions with Power Rail Booster for PROFIBUS with non-contact data transmission technology; Advantages: no wear of sliding contacts
- For installation in the casing of the Power Rail Booster (common with overhead conveyor and automated guided vehicles) to degree of protection IP20
- High, reliable data throughput together with rapid roaming
- High degree of protection against unauthorized access thanks to 128-bit encoding (AES)
- Module replacement without the need for a programming device, using the C-PLUG swap media for backing up the configuration data
- Integration in STEP 7

Benefits

get Designed for Industry

- High mobility;
  increased plant availability through wireless data transmission to mobile communication partners, e.g. to control an automated guided vehicle system (AGVS)
- Wear-free;
  contact-free technology with RCoax as a substitute for contact wires, e.g. in monorail overhead conveyors
- Integration of PROFIBUS field devices into an IWLAN radio network (investment protection)
- Designed for compatibility with Power Rail Booster;
  optimized for installation in overhead conveyors with ET 200S
- Flexible implementation by connecting an IWLAN antenna or an alternative antenna for RCoax cable
- Module replacement without the need for a programming device, using the C-PLUG swap media for backing up the configuration data

Application

The IWLAN Link PN IO supports the use of an IWLAN with RCoax and WLAN antennas for wireless or contact-free data transmission e.g. in monorail overhead conveyors or storage and retrieval systems. With the support of PROFINET the numerous different PROFIBUS system functions, such as diagnosis over the bus, remain available.

- Monorail overhead conveyors;
  vehicle controllers for monorail overhead conveyors can be implemented at low cost on the basis of SIMATIC components. High availability, short response times and easy expansion can be achieved by using distributed controllers, such as SIMATIC ET 200S IM 151/CPU. The IWLAN/PB Link PN IO allows the vehicle control systems to be used unchanged. The user can also program them remotely with STEP 7 over IWLAN.
- Storage and retrieval systems;
  with these systems, data light barriers requiring intensive maintenance can be replaced by an IWLAN solution. This enhances plant availability.

Design

The IWLAN/PB Link PN IO is snapped onto a standard rail, and the outer dimensions correspond to the housing of the Power Rail Booster. Using a connector, either an antenna for RCoax or an antenna for an IWLAN radio field can be connected.
The degree of protection IP20 ensures that the IWLAN/PB Link PN IO is suitable for installation in the control cabinet.

- Compact design;
  the rugged plastic casing features on the front:
  - an R-SMA interface for connecting antennae
  - one 9-pin Sub-D socket for connection to PROFIBUS
  - one 4-pin terminal strip for connecting the external supply voltage of 24 V DC.
  - Diagnostic LEDs
- Can be operated without a fan
- Fast device replacement in the event of a fault by using the optional C-PLUG swap medium (not included in scope of supply)

Function

PROFINET

- PROFINET IO proxy;
  wireless connection of PROFIBUS DP slaves to PROFINET IO controller according to PROFINET standard

Diagnostics

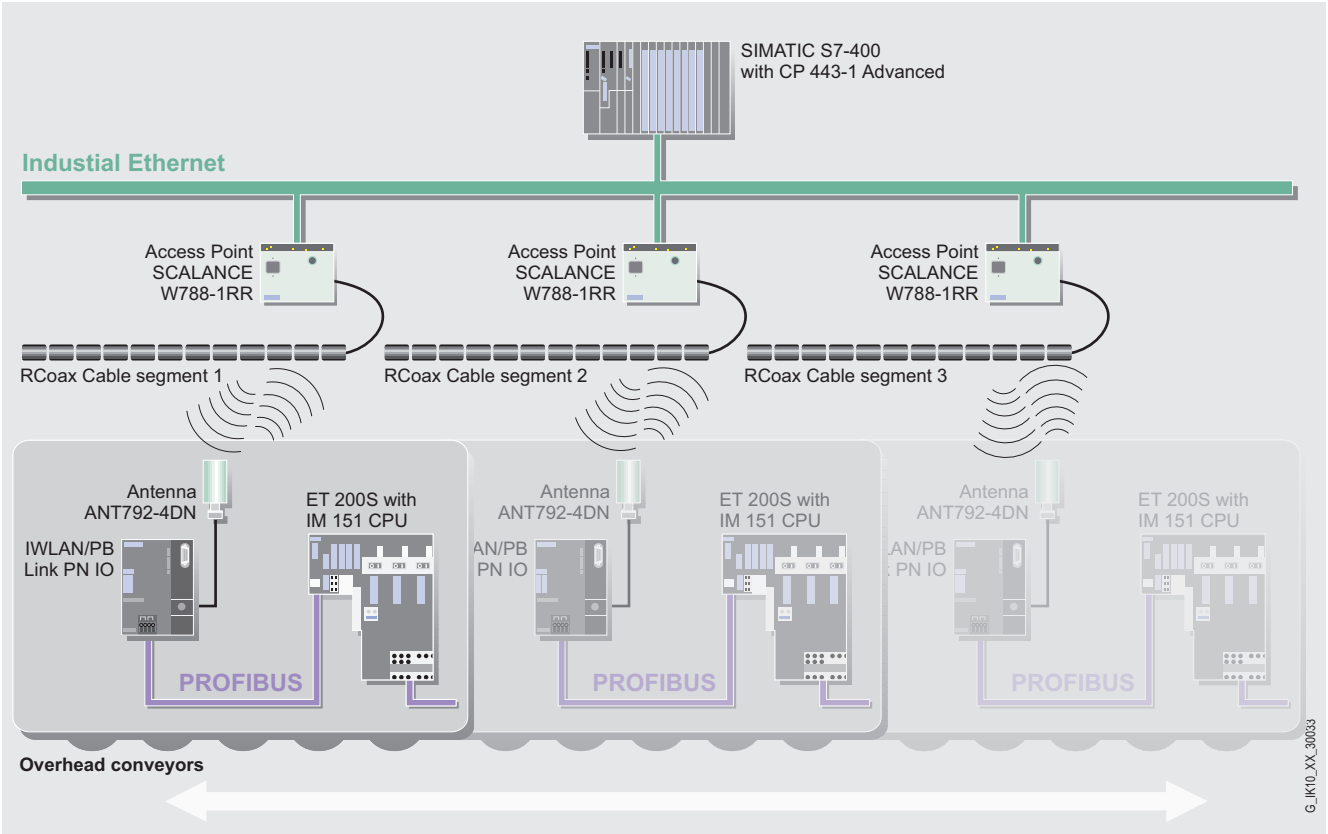
Extensive diagnostic options are available via STEP S7 or SNMP, including:

- Diagnosis of the assigned PROFINET field devices;
  using the IWLAN/PB Link PN IO as a proxy, the connected DP slaves can be diagnosed in the same manner as PROFINET IO devices (also in the user program of the PROFINET IO controller)
- General diagnostics and statistics functions
- Connection diagnostics
- LAN controller statistics
- Diagnostics Buffer
- Integration into network management systems through the support of SNMP V1 MIB-II

Configuring

With STEP 7 V 5.3 SP2 or higher (HSP IWLAN/PB Link PN IO necessary), the parameters required for the IWLAN/PB Link PN IO, e.g. the addresses, are assigned and all the necessary routing information is automatically generated.

Integration



System solution with IWLAN/PB Link PN IO using example of overhead conveyor

IWLAN/PB Link PN IO

Technical specifications

Transmission rates	
• Radio	1 to 54 Mbits/s
- Standards supported	802.11a, 802.11b, 802.11g
• PROFIBUS	9.6 kbit/s to 12 Mbit/s incl. 45.45 kbit/s (PROFIBUS PA)
Interfaces	
• Connection to Industrial Wireless LAN	R–SMA antenna socket
• Connection to PROFIBUS	9-pin Sub D socket
- Maximum segment length for PROFIBUS [1]	20 m
- Maximum current consumption at the PROFIBUS interface with connection of network components (for example, optical network components)	100 mA at 5 V
• Connection for power supply	4-pin terminal block
Power supply [2]	2 supplies for 20.4 V DC to 28.8 V DC
Current consumption (at rated voltage)	
• external from 24 V DC, max.	300 mA
Power loss	Approx. 6.5 W
Perm. ambient conditions	
• Operating temperature	0 °C to + 60 °C
• Transport/storage temperature	- 40 °C to + 70 °C
• Relative humidity, max.	95 % at +25 °C
Construction	
• Module format	Power Rail Booster enclosure
• Dimensions (W x H x D) in mm	90 x 132 x 75
• Weight	Approx. 300 g
Degree of protection	IP20
Configuring	
Configuration software	STEP 7/NCM S7 with V5.3 SP2 or later plus Hardware Support Package for IWLAN/PB Link PN IO
Performance data	
PROFINET communication	
• Number of DP slaves on the IWLAN/PB Link PN IO (PROFINET IO-Devices for PROFINET IO)	Max. 8
• Number of DP inputs.	Max. 256 byte
• Number of DP outputs.	Max. 256 byte
Additional functionality	
• Number of S7 connections	Max. 8
• Number of DSGW connections	Max. 8

1) A repeater is required if the specified length is exceeded

2) The power supply is electrically isolated; a high-impedance connection (>700 kΩ) exists to the contact spring for mounting of the enclosure on the DIN rail).

Ordering data

		Order No.
IWLAN/PB Link PN IO Router between Industrial Wireless LAN and PROFIBUS with PROFINET IO functionality, TCP/IP, S7-Routing, IEEE 802.11 b/g/a at 2.4/5 GHz to 54 Mbit/s, 9.6 kbit/s to 12 Mbit/s PROFIBUS; including electronic manual on CD-ROM German, English, French, Spanish, Italian	E	
• National approvals for operation outside the U.S.A. and Canada		**6GK1 417-5AB00**
• National approvals for operation inside the U.S.A.and Canada		**6GK1 417-5AB01**
C-PLUG Swap medium for simple replacement of devices in the event of a fault; for storing configuration or engineering and application data; can be used for SIMATIC NET products with C-PLUG slot	A	**6GK1 900-0AB00**
NCM S7 configuration software for Industrial Ethernet		Delivered with STEP 7 V5.3
Documentation S7-CPs/NCM Paper version for Industrial Ethernet and PROFIBUS; manual package for configuring S7-CPs, IE/PB Link and PC-Station (STEP 7 V5.3)		
• German		**6GK7 080-0AA01-8AA0**
• English		**6GK7 080-0AA01-8BA0**
S7-300 power supply PS 307 24 V DC		**6ES7 307-1BA00-0AA0**
IWLAN RCoax cables Leaky wave conductor for complex radio environments as special antenna for SCALANCE W Access Points; 2.4 GHz long distance; for enhanced temperature range (-40 °C to + 85 °C); sold by the meter		**6XV1 875-2A**
IWLAN RCoax N-Connect Female Antenna ANT792-4DN RCoax helical antenna with circular polarization for RCoax systems; 2.4 GHz; N-Connect female connection; antenna gain 1 dB at 2.4 GHz; degree of protection IP67; ambient temperature -20°C to +60°C		**6GK5 792-4DN00-0AA6**
SCALANCE W788-1PRO IWLAN Access Point with built-in radio interface; radio networks IEEE 802.11b/g/a at 2.4/5 GHz to 54 Mbit/s; national approvals; WPA/AES; Power over Ethernet (PoE), degree of protection IP65 (-20°C to +60°C); scope of supply: 2 antennas ANT795-4MR, IP67 hybrid plug-in connector, assembly material, manual on CD-ROM; German/English	E	
• National approvals for operation outside the U.S.A. and Canada		**6GK5 788-1ST00-2AA6**
• National approvals for operation inside the U.S.A. and Canada		**6GK5 788-1ST00-2AB6**

A) Subject to export regulations: AL: N and ECCN: EAR99H

E) Subject to export regulations: AL: N and ECCN: 5D002ENC3

Ordering data

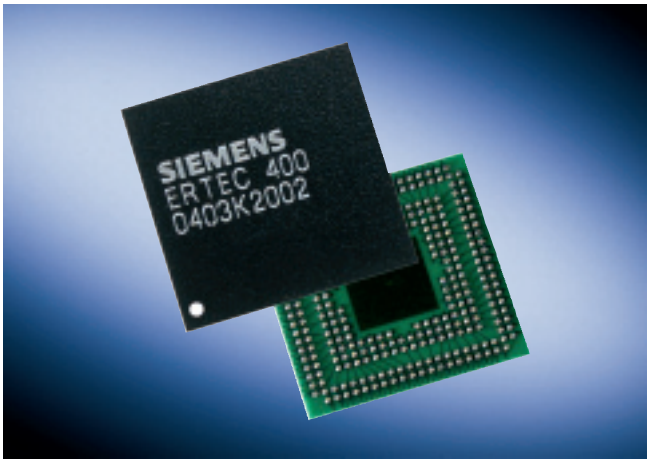
	Order No.
SCALANCE W788-2PRO E IWLAN Dual Access Point with two built-in radio interfaces; radio networks IEEE 802.11b/g/a at 2.4/5 GHz to 54 Mbit/s; national approvals; WPA/AES; Power over Ethernet (PoE), degree of protection IP65 (-20°C to +60°C); scope of supply: 2 antennas ANT795-4MR, IP67 hybrid plug-in connector, assembly material, manual on CD-ROM; German/English	
• National approvals for operation outside the U.S.A.and Canada	**6GK5 788-2ST00-2AA6**
• National approvals for operation inside the U.S.A.and Canada	**6GK5 788-2ST00-2AB6**
SCALANCE W788-1RR E IWLAN Access Point with built-in radio interface; Industrial Wireless LAN Rapid Roaming (IWLAN RR) or Industrial Wireless LAN (IWLAN); radio networks IEEE 802.11b/g/a at 2.4/5 GHz to 54 Mbit/s; national approvals; WPA/AES; Power over Ethernet (PoE), degree of protection IP65 (-20°C to +60°C); scope of supply: 2 antennas ANT795-4MR, IP67 hybrid plug-in connector, assembly material, manual on CD-ROM; German/English	
• National approvals for operation outside the U.S.A.and Canada	**6GK5 788-1SR00-2AA6**
• National approvals for operation inside the U.S.A.and Canada	**6GK5 788-1SR00-2AB6**
SCALANCE W788-2RR E IWLAN Dual Access Point with two built-in radio interfaces; Industrial Wireless LAN Rapid Roaming (IWLAN RR) or Industrial Wireless LAN (IWLAN); radio networks IEEE 802.11b/g/a at 2.4/5 GHz to 54 Mbit/s; national approvals; WPA/AES; Power over Ethernet (PoE), degree of protection IP65 (-20°C to +60°C); scope of supply: 2 antennas ANT795-4MR, P67 hybrid plug-in connector, assembly material, manual on CD-ROM; German/English	
• National approvals for operation outside the U.S.A.and Canada	**6GK5 788-2SR00-2AA6**
• National approvals for operation inside the U.S.A.and Canada	**6GK5 788-2SR00-2AB6**

E) Subject to export regulations: AL: N and ECCN: 5D002ENC3

	Order No.
RCoax N-Connect Male Termination Impedance Terminating resistor, 50 Ohm	**6GK5 795-1TN00-1AA0**
RCoax N-Connect Female N-Connector Plug-in connector for assembly in the field	**6GK5 798-0CN00-0AA0**
RCoax N-Connect male/male Flexible connecting cable e.g. between two RCoax segments	
• 1 m	**6XV1 875-5AH10**
• 5 m	**6XV1 875-5AH50**
RCoax N-Connect/R-SMA male/male Flexible connecting cable for components with R-SMA connection and RCoax N-Connect	
• 1 m	**6XV1 875-5CH10**
• 5 m	**6XV1 875-5CH50**
RCoax R-SMA/SMA Male/Male Flexible Connection Cable Flexible cable for connecting an IWLAN/PB Link PN IO to components with R-SMA and SMA connections, e.g. cabinet feedthrough; assembled with two R-SMA to N-male connectors	
• 0.3 m	**6XV1 875-5DE30**
RCoax N-Connect/R-SMA female/female panel feedthrough Panel feedthrough for wall thicknesses up to 5.5 mm, R-SMA female and N-female connections	**6GK5 798-0PT00-2AA0**
Preset-PLUG Swap medium for simple initial startup of IWLAN clients, e.g. IWLAN/PB Link PN IO	**6GK5 798-8AB00**

ERTEC 400

Overview



The Industrial Ethernet ASIC ERTEC 400 (Enhanced Real-Time Ethernet Controller) is a high-performance Ethernet controller with an integral 4-port real-time switch and integral 32-bit microprocessor developed for industrial use. It features a rugged construction, specific automation functions and openness to the IT world.

- Easy space-saving connection of devices to switched 10/100 Mbit Ethernet
- No need for external network components since the switches are integrated into the device
- Integral high-performance ARM 946 processor for optimum integration of communications and applications
- PCI interface for optimum integration in PC-based environment
- Specific communication functions for automation technology secure the position of the technology as front runner for time-critical applications through real-time characteristics
- Fault-tolerant applications can be replaced during normal operation thanks to redundant transmission characteristics
- The user is aided by the DK-ERTEC 400 PN IO development kit and worldwide technical support.

Benefits

get Designed for Industry

- All functions on chip for high-performance systems solutions (system on chip)
- Space-saving implementation thanks to a high degree of integration
- Complete communication processing for real time
- Broad field of application thanks to comprehensive interfaces
- Openness through compatibility to IEEE 802
- Industry-standard environmental characteristics
- Supports IT communication and real-time data communication in parallel and unlimited on one line
- PCI, the bus standard of the PC world, is a component of the ERTEC 400. This saves space, time and costs during integration into PC-based system environments and ensures a fast "time to market".

Application

PROFINET is the system solution for automation engineering that is characterized by openness, scalability and performance. PROFINET also satisfies the requirements of factory automation and motion control applications. This supports integrated system solutions that go much further than specific machine solutions. Thanks to innovative switching technology, the special requirements of automation with regard to line topology, hard real time and unlimited IT openness have been satisfied within a single technology for the first time.

The ERTEC 400 PROFINET provides real-time properties based on the transmission procedures of IEEE 802: Real-time (RT) and isochronous real-time (IRT(available soon)). To achieve this, it provides intelligent combination of the switching mechanisms "Cut Through" and "Store and Forward".

Integrated plant and machine solutions are possible that are compatible with the standard.

In addition to providing the PROFINET mechanisms, the Industrial Ethernet ASIC ERTEC 400 based on the latest semiconductor technology has all the functions on chip that are required for high-performance system functions in the automation industry.

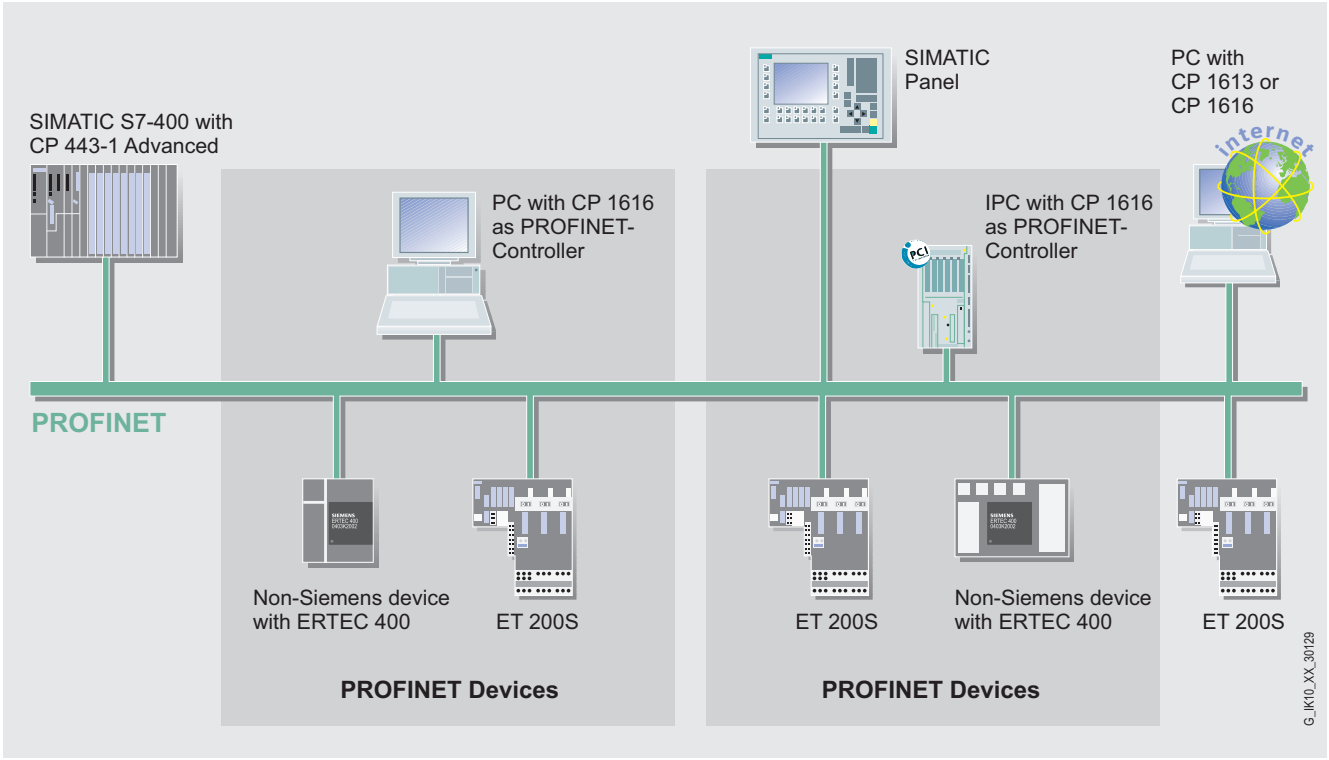
By integrating the powerful ARM 946 processors, the necessary flexibility is offered for creating demanding applications.

The target systems for the ERTEC 400 are programmable controllers that use Switched Fast Ethernet to increase the previous automation performance and simultaneously offer integration into the modern world of IT.

The real-time functions integrated into ERTEC 400 are a new development for time-critical applications that open a new chapter in automation engineering. With simultaneous openness for standard protocols from the IT world, they permit extremely fast isochronous transmission of data in real-time. This means that in the context of PROFINET, system solutions are possible that set new standards.

The ERTEC 400 combines real time and IT without making any compromises. With a cycle time of 1 ms, for example, 150 axes can be controlled in isochronous mode whereby 50% of the bandwidth is available solely for IT communication.

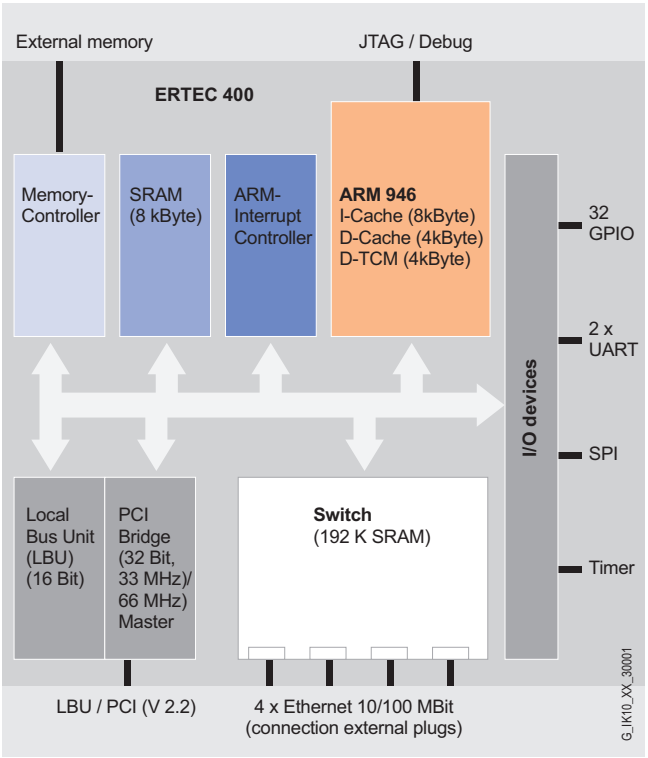
Application (continued)



PROFINET communication with ERTEC 400

ERTEC 400

Design



Internal design of ERTEC 400

Function

- Switching;
  in accordance with industrial requirements, the integral 4-port switch additionally enables lines to be configured with branches and there is no need for external switch components.
- Real-time;
  the real-time properties (RT and IRT (available soon)) allow extremely short cycle times with highly accurate cycle rates. PROFINET with the ERTEC 400 is the quantum leap forward in drive control systems and makes drive concepts possible that could never be achieved before.
- Redundancy;
  for the ERTEC 400, industry-compatible design means redundant data transmission with bumpless changeover with IRT communication.
- IT;
  the high processor performance and the on-chip memory form a stable basis for implementing IT functions such as a Web server and e-mail.
- PCI;
  PCI, the bus standard of the PC world, is a component of the ERTEC 400. This saves space, time and costs during integration into PC-based system environments and ensures a fast "time to market".
- Network management/diagnostics;
  comprehensive diagnostic characteristics such as RMON statistical counter permit effective system diagnostics.

DK-ERTEC 400 PN IO development kit

The development kit makes it easy for beginners. It contains the necessary hardware, drivers, configuration software, demonstration programs and documentation. IRT support available soon.

Technical support

Industrial Ethernet ASICs from Siemens provide the customer with worldwide support and implementation support. The two Competence Centers in Europe and the USA provide low-cost telephone support for development and commissioning engineers. Development orders for software and hardware as well as on-site support are included in the comprehensive range of services offered.

Technical specifications

Transmission rate	10/100 Mbit/s
Interfaces	
• Ethernet / PPHY interface	• 4 x PHY interface • Half/full duplex • Broadcast filter • IEEE 802.1 p Traffic Management • IEEE 802.1 q VLAN Tagging and Identification • IEEE 1588 • In association with the corresponding PHY types: - Supports copper and fiber-optic conductors - Autosensing - Autocrossover
• Local bus unit (LBU)	• Local bus master interface for an external host with access to internal areas of the ERTEC 400 • 16-bit data width
• PCI interface	• 32 bit, 33/66 MHz • Host functionality • Memory protection unit (MPU) • 2 PCI interrupt outputs INTA_N and SERR_N • Power Management V1.1 • 3.3 Volt (5 V tolerant) • PCI master/target interface • PCI core conformant to PCI spec. 2.2
• External memory interface (EMIF)	• SDRAM controller 128 MB/16 bit or 256 MB/32 bit • SRAM controller 4 x 16 MB for asynchronous blocks (SRAM, Flash, I/O 8/16/32 bit) • Chip select support
• IO interfaces	• 32 parameterizable I/O (GPIO) • Multifunctional outputs
Components	
• Real-time Ethernet switch	• Integral 4-port Fast Ethernet/ real-time Ethernet switch • 10/100 Mbit Ethernet full-duplex • 192 KB communications RAM (SRAM on chip for message buffering) • Intelligent switching and PROFINET IRT prioritizing/timing
• Integral ARM946 processor	• 32-bit ARM system • Adjustable working frequency 50/100/150 MHz • 4 KB data cache • 8 KB instruction cache • 4 KB D-TCM • Memory protection unit (MPU) • Trace functionality ,debugging capability through embedded ICE (JTAG) • Interrupt controller for 16xIRQ/ 8xFIQ
• Processor I/O	• 2 UART similar to the UART 16C550 standard • SPI master interface • 2 x timer 32-bit counting downwards • F-Timer 32-bit counting downwards • 2 watchdog functions • External interrupt inputs

Components (continued)	
• Internal bus structure	• Internal 32-bit bus structure (multi-layer AHB) with 50 MHz clock • Multi-layer architecture with parallel access of several multimasters to multislave
• SRAM-integrated main memory on AHB	• Size 8 KB • Program/data memory ARM946 • Multiport RAM for ARM946, IRT and PCI
• Clock generation	Internal clock generation through PLL for ARM 946ES, AHB, APB and IRT
• Boot ROM	Boot ROM with Opcode for software download from various sources
• Debugging functions	Boundary scan
Power supply	
• Core	1.5 V +/- 10%
• I/Os	3.3 V +/- 10%
Current consumption	
• at 1.5 V	typ. Xx mA
• at 3.3 V	typ. Xx mA
Power loss	
• at 1.5 V	typ. 0.4 W
• at 3.3 V	typ. 0.5 W
Perm. ambient conditions	
• Operating temperature	-40 °C to +85 °C
• Transport/storage temperature	-40 °C to +85 °C
• Relative humidity	Max. 95% at +25 °C
Construction	
• Enclosure	Plastic – FBGA 304 pin
• Pinning	Ball Pitch 0.8 mm
• Soldering notes	Processing with lead solder (version for processing with lead-free solder available soon)
• Dimensions (W x H x D) in mm	
- ERTEC 400 (1 unit)	19 x 1 x 19
- Tray (with 70 ERTEC units)	320 x 136 x 8
- Drypack (with 350 ERTEC units)	350 x 21 x 9
• Weight	
- ERTEC 400 (1 unit)	Approx. 1 g
- Tray (with 70 ERTEC units)	Approx. 100 g
- Drypack (with 350 ERTEC units)	Approx. 1420 g
Supported communications protocols	
• General Ethernet protocols	Corresponding to the respective software implementation which uses the ERTEC as Ethernet controller
• PROFINET	In combination with a PROFINET software stack • Real-time communication (RT) • Isochronous real-time communication (IRT (available soon))

ERTEC 400

Note

If you have any technical questions, please contact the PROFINET Competence Centers:

Germany and Europe

Siemens AG
ComDeC
P.O. Box 2355
D-90713 Fürth
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Tel.: +49/911/750 - 2080
Fax: +49/911/750 - 2100
E-mail: comdec@fthw.siemens.de

America

PIC - PROFIBUS Interface Center
One Internet Plaza
Johnson City, TN, 37604
U.S.A.
Tel.: (423) - 262 - 2576
Fax: (423) - 262 - 2103
E-mail: profibus.center@sea.siemens.com

Ordering data

		Order No.
ERTEC 400 ASIC ERTEC 400 for connecting to Switched Ethernet 100 Mbit/sec, Ethernet Controller with integral 4-port switch, ARM 946 processor and PCI interface (V 2.2), data preprocessing for real-time and isochronous real-time (available soon) with PROFINET IO	L	
• Single tray, 70 units		**6GK1 184-0BA00-0AA1**
• Drypack (5 trays), 350 units		**6GK1 184-0BA00-0AA2**
DK-ERTEC 400 PN IO development kit Development package V1.0 for ASIC ERTEC 400 for real-time and isochronous real-time (available soon), comprising: CP 1616, ERTEC 400 evaluation board, ASICs ERTEC 400 (10 units), IE FC RJ45 Plug 180, IE FC Standard Cable 2 x 2, IE FC Stripping Tool, DK-16xx PN IO documentation and example software	L	**6GK1 953-0CA00**

L) Subject to export regulations: AL: 3A001A10B and ECCN: N

DK-ERTEC 400 PN IO development kit

Overview

- Development kit for development of PROFINET and Industrial Ethernet devices with integral real-time switch
- Possible applications:
  - Development of IO field devices (as PROFINET IO-Device) with a PROFINET interface
  - Development of drives with a PROFINET interface (the real-time characteristic IRT will be supported at a later stage)
  - Development of any other device with an Industrial Ethernet interface

Benefits

get Designed for Industry

- Devices can easily be developed for Industrial Ethernet with PROFINET
- Optimized components are included for developing a PROFINET device
- Easy adaptation to the characteristics of the device to be developed using the supplied software examples
- Easy creation of a specific GSDML file using the supplied example
- EB 400 development board in the PC or as stand-alone outside a PC can be operated as an IO-Device
- Shortening of development time through complete development environment including executable example applications

Application

Using the DK-ERTEC 400 PN IO development kit, PROFINET hardware and software applications can be developed and tested using the ASIC ERTEC 400.

The comprehensive, perfectly interacting hardware and software components considerably reduce the development costs for a PROFINET IO device (as PROFINET IO-Device).

The development kit offers a fully functional development environment which development engineers can build on with their special requirements for hardware and software.

The documentation is supplied on CD in English and German.

The development kit makes the PROFINET technology accessible to device vendors and users. The two PROFINET Competence Centers in Europe and the USA provide low-cost telephone support for development and commissioning engineers. Development orders for software and hardware as well as on-site support are included in the comprehensive range of services offered by the Competence Centers .

The PROFINET real-time property (RT) is supported in version V1.0. A future version of the DK-ERTEC 400 PN IO will also support the isochronous real-time property (IRT).

Operating system environment

The current version of the development kit can only be used together with the VxWorks 5.5.1 operating system from the company Wind River. An installation CD is provided with the development kit with which the user can activate a limited-period evaluation license at Wind River. It is subsequently possible to purchase a full license version from Wind River at special conditions for ERTEC 400 users.

Note:
The full version of the Wind River license also includes the runtime license fees for ERTEC-based PROFINET devices. No additional runtime license fees are then incurred for VxWorks. The Wind River licenses must be ordered by users directly from Wind River. All license details concerning Wind River products are exclusively covered by the specifications provided by Wind River to the user
(see *http://www.windriver.com/alliances/eval-cd/details.html?pgmid=ERTEC*)

Production license for PROFINET IO-Devices

The development kit includes a development license which authorizes users to develop and test PROFINET IO-Devices on the basis of ERTEC 400. For production of series devices, a production license for PROFINET IO-Devices must be additionally purchased for each production line. This production license is included in the "PROFINET IO Development Kit" (6ES7 195-3BC00-0YA0) and must be ordered separately.

DK-ERTEC 400 PN IO development kit

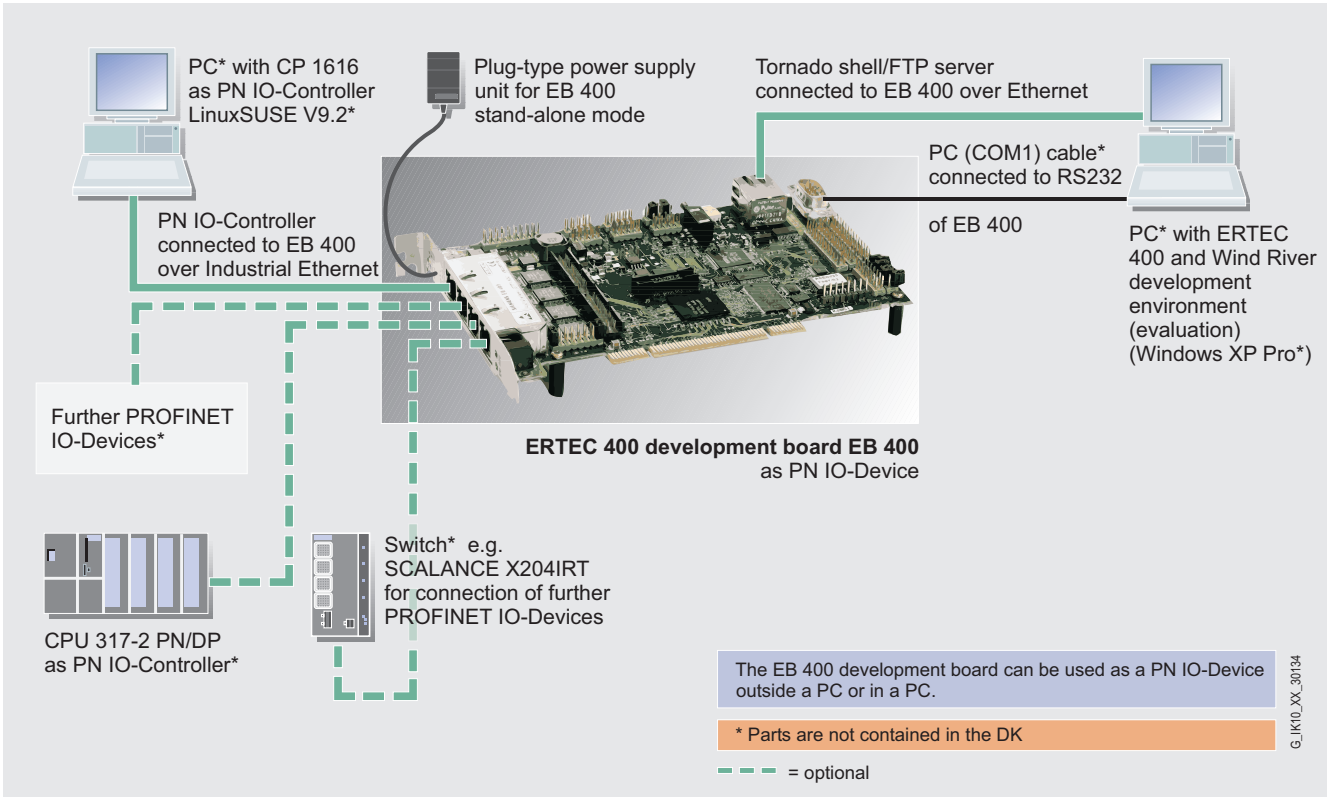
Design

Hardware included

- *CP 1616;*
  PC module for operation as PROFINET IO-Controller as test partner
- *ERTEC 400 Evaluation Board;*
  evaluation board with the ASIC ERTEC 400 as a test environment for customized applications
- *ERTEC 400 ASICs;*
  for developing customized hardware, 10 ERTEC 400 ASICs are already included in the package.
- *FastConnect;*
  for easy assembly of Industrial Ethernet cables, FastConnect connectors, cables and the stripping tool are included

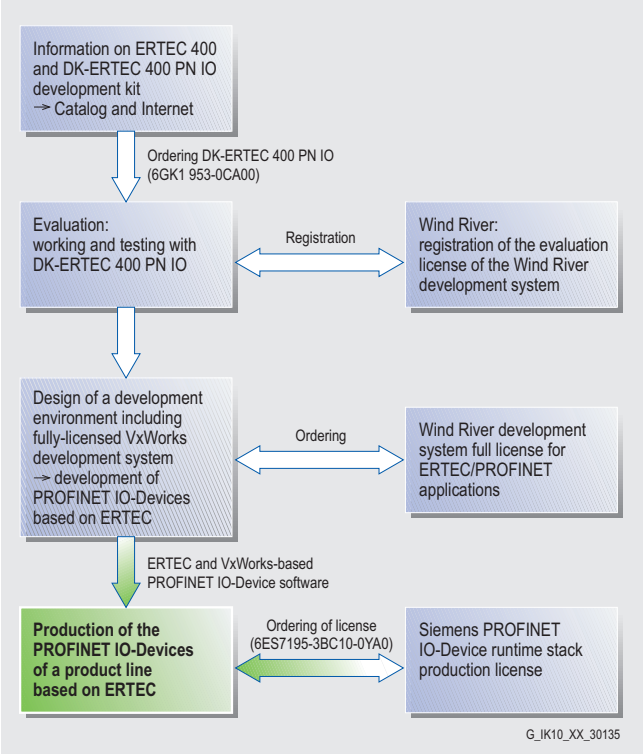
Software included

- *PROFINET IO-Controller example software;*
  test and simulation software for Windows XP Professional for use on PCs
- *PROFINET IO Device software example;*
  sample program as PROFINET IO Device based on the ERTEC 400
- *DK-16xx PN IO;*
  Development Kit for CP 1616 for operation with Linux SUSE 9.2 or for transfer to other PC-based operating systems
- *Wind River software*
  Fully functional version of Tornado/Vx Works and WindView but with time limit



Design of a development environment with DK-ERTEC 400 PN IO

Design (continued)



Application of Development Kit and assignment of required software licenses

Technical specifications

You can find further information, technical specifications and manuals on ERTEC 400 and DK-ERTEC 400 PN IO on the Internet at the following addresses:

- http://cache.automation.siemens.com/dnl/TUyOTgxAAAA_21640983_HB/DK_ERTEC400_Readme.pdf
- http://www.automation.siemens.com/profinet/html_00/products/ertec_400.htm
- http:// www.ad.siemens.de/csi/pnio-doc (German manuals)
- http:// www.ad.siemens.de/csi_en/pnio-doc (English manuals)

If you have any technical questions, please contact the PROFINET Competence Centers:

Germany and Europe

Siemens AG
ComDeC
P.O. Box 2355
D-90713 Fürth
Germany
Tel.: +49/911/750 - 2080
Fax: +49/911/750 - 2100
E-mail: comdec@fthw.siemens.de

America

PIC - PROFIBUS Interface Center
One Internet Plaza
Johnson City, TN, 37604
U.S.A.
Tel.: (423) - 262 - 2576
Fax: (423) - 262 - 2103
E-mail: profibus.center@sea.siemens.com

DK-ERTEC 400 PN IO development kit

3

Ordering data

		Order No.
DK-ERTEC 400 PN IO development kit Development package V1.0 for ASIC ERTEC 400 for real-time and isochronous real-time (available soon) comprising: CP 1616, ERTEC 400 evaluation board, ASICs ERTEC 400 (10 units), IE FC RJ45 Plug 180 (2 units), IE FC Standard Cable 2 x 2 (5 m), IE FC Stripping Tool, DK-16xx PN IO V 1.0, Wind River evaluation software, documentation and example software	L	**6GK1 953-0CA00**
PROFINET IO production license for one product line Included in PROFINET IO development kit		**6ES7 195-3BC00-0YA0**
PROFINET IO Controller		
CP 1616 communications processor PCI card (32-bit; 3.3/5 V) with ASIC ERTEC 400 for connecting to PROFINET IO with 4-port real-time switch (RJ45), for use with DK-16xx PN IO development kit; NCM PC	A	**6GK1 161-6AA00**
SOFTNET PN IO Edition 2005 Software for PROFINET I/O controller with OPC server and NCM PC single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server; Windows 2000 Professional, Server for CP 1512 and CP 1612, German/English	D	**6GK1 704-1HW63-3AA0**
CPU 317-2 PN/DP Main memory 512 KB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface, MMC required		**6ES7 317-2EJ10-0AB0**

A) Subject to export regulations: AL: N and ECCN: EAR99H
D) Subject to export regulations: AL: N and ECCN: 5D992B1
E) Subject to export regulations: AL: N and ECCN: 5D002ENC3
L) Subject to export regulations: AL: N and ECCN: 3A001A1A

		Order No.
Network components		
IE FC RJ45 Plug 180 RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface		
• 1 pack = 1 unit		**6GK1 901-1BB10-2AA0**
• 1 pack = 10 units		**6GK1 901-1BB10-2AB0**
• 1 pack = 50 units		**6GK1 901-1BB10-2AE0**
IE FC Standard Cable 2 x 2 (Type B) 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m		**6XV1840-2AH10**
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables		**6GK1901-1GA00**
Industrial Ethernet switches SCALANCE X-200IRT Managed Industrial Ethernet switches; real-time (RT) and isochronous real-time (IRT (available soon)), LED diagnostics, error signaling contact with SET button, redundant power supply	E	
• **SCALANCE X-204IRT**; 4 x 10 10/100 Mbit/s RJ45 ports		**6GK5 204-0BA00-2BA3**
• **SCALANCE X-202-2IRT**; 2 x 10 10/100 Mbit/s RJ45 ports; 2 x 100 Mbit/s Multimode BFOC		**6GK5 202-2BB00-2BA3**
ASIC Enhanced Real-Time Ethernet Controller		
ERTEC 400 ASIC ERTEC 400 for connecting to Switched Ethernet 100 Mbit/s, Ethernet Controller with integral 4-port switch, ARM 946 processor RISC and PCI interface (V2.2), data preprocessing for real-time and isochronous real-time (available soon) with PROFINET IO	L	
• Single tray, 70 units		**6GK1 184-0BA00-0AA1**
• Drypack (5 trays), 350 units		**6GK1 184-0BA00-0AA2**

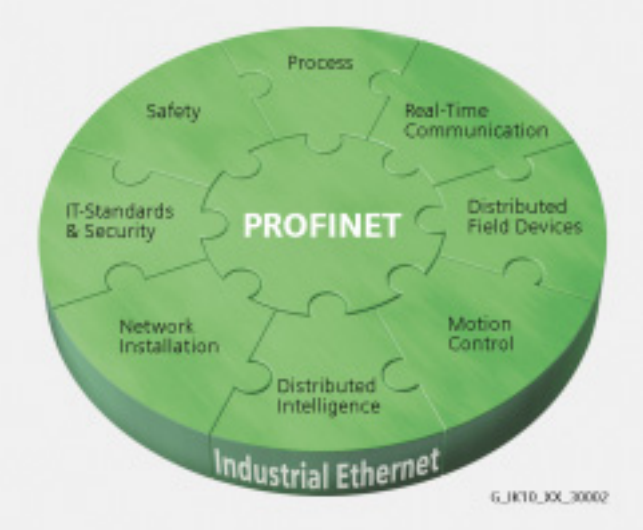
More information

The Wind River development environment can be obtained from:
Wind River GmbH
Osterfeldstrasse 84
D-85737 Ismaning
Tel.: +49 89 96 24 45 0
Fax: +49 89 96 24 45 999
inquiries-de@windriver.com

Additional information can be found in the Internet under:

http://www.windriver.com/alliances/eval-cd/details.html?pgmid=ERTEC

Overview



In time for market entry of PROFINET IO, a development package is available that allows third-party manufacturers to develop and offer their own PROFINET IO devices.

Design

The Development Kit comprises a CD and the license conditions in paper form (COL; Certificate of License). This is a single license which is valid for development and for a single product line. For implementation of different product lines, a second license is required that will be available under the same order number.

The Development Kit CD contains:

- Firmware stack in source code for PROFINET IO, adapted by way of example to the NetARM processor Net+50 of NetSilicon. This firmware stack can, of course, also be ported to every other processor of NetSilicon or of any other manufacturer.
- User manual for the PN IO stack
- Comprehensive documentation and program examples for an I/O device
- Comprehensive documentation and program examples for a CPU 317-2 PN/DP which can be used as a test partner (IO Controller). This test partner and the remaining development environment is not included in the Development Kit and must be ordered separately.

Further necessary components (to be ordered separately):

- CPU 317-2 PN/DP with FW version V2.3
- MMC (512 KB or larger)
- STEP 7 V5.3 SP1
- Switch
- Cable (3 items)
- Power supply for the CPU (optional; a generally available 24 V power supply can also be used.)

The "rest" of the development environment is also necessary and must be ordered separately:

- Net+50 processor
- TCP/IP stack
- Development system (operating system "ThreadX RTOS")
- Development board

This "rest" of the development environment must be ordered from NetSilicon (for address, see "Further information").

Technical specifications

Please address any technical questions about the development kit to:

In Germany and Europe

Siemens AG
ComDeC
P.O. Box 2355
90713 Fürth
Germany
Tel.: +49/911/750 - 2080
Fax: +49/911/750 - 2100
E-mail: comdec@fthw.siemens.de

America

PIC - PROFIBUS Interface Center
One Internet Plaza
Johnson City, TN, 37604
U.S.A.
Tel.: (423) - 262 - 2576
Fax: (423) - 262 - 2103
E-mail: profibus.center@sea.siemens.com

Development packages

Ordering data		Order No.
Development package for PROFINET IO For Ethernet processor	B	**6ES7 195-3BC00-0YA0**
Accessories		
CPU 317-2 PN/DP 512 KB main memory, 24 V DC supply voltage, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; MMC required		**6ES7 317-2EJ10-0AB0**
Micro Memory Card e.g. 512 KB (other MMC optional)		**6ES7 953-8LJ11-0AA0**
Programming software STEP 7, V5.3, SP1 Floating license, STL, LAD. FBD programming for S7-300/400/C7 and WinAC		**6ES7 810-4CC07-0YA5**
Industrial Ethernet switches SCALANCE X-100 Industrial Ethernet Switches for 10/100 Mbit/s		
• **SCALANCE X108** with eight 10/100 Mbit/s RJ45 ports for designing star structures		**6GK5 108-0BA00-2AA3**
• **SCALANCE X-104-2** with four 10/100 Mbit/s RJ45 ports and two FOC ports for designing line structures		**6GK5 104-2BB00-2AA3**
• **SCALANCE X-106-1** with six 10/100 Mbit/s RJ45 ports and one FOC port for designing star structures		**6GK5106-1BB00-2AA3**
Industrial Ethernet switches SCALANCE X-200IRT Managed Industrial Ethernet switches; real-time (RT) and isochronous real-time (IRT (available soon)), LED diagnostics, error signaling contact with SET button, redundant power supply		
• **SCALANCE X-204IRT** 4 x 10 10/100 Mbit/s RJ45 ports		**6GK5 204-0BA00-2BA3**
• **SCALANCE X-202-2IRT** 2 x 10 10/100 Mbit/s RJ45 ports; 2 x 100 Mbit/s Multimode BFOC		**6GK5 202-2BB00-2BA3**
SIMATIC NET TP cable RJ45/RJ45, length 2 m At least 3 items will be required; other cable types/lengths optional		**6XV1 850-2GH20**
PS 307 power supply 120 V AC, 24 V DC, 2 A (optional)		**6ES7 307-1BA00-0AA0**

B) Subject to export regulations: AL: N and ECCN: EAR99S

More information

The development environment can be obtained from NetSilicon:

In Germany and Europe

Digi GmbH (NetSilicon)
Joseph-von-Fraunhofer-Str. 23
44227 Dortmund
Germany
Tel: +49 231 9747 550
Fax: +49 231 9747 650
E-mail: emea-sales@netsilicon.com

Additional information can be found in the Internet under:

http://www.netsilicon.com/

U.S.A.

NetSilicon, Inc.
411 Waverley Oaks Road #304
Waltham, MA 02452
U.S.A.
Tel: ++1 800 243-2333, 781 647-1234
Fax: ++1 781 893-1338
E-mail: info@netsilicon.com

Additional information can be found in the Internet under:

http://www.netsilicon.com/

Asia

NetSilicon Japan, Inc.
NES Bldg. South 8F 22-14 Sakuragaoka-cho
Shibuya-ku, Tokyo, 150-0031
Japan
Tel: +81-3-5428-0261
Fax: +81-3-5428-0262
E-mail: japan-sales@netsilicon.com

Additional information can be found in the Internet under:

http://www.netsilicon.co.jp/